

PROCEEDINGS

OF THE

Punjab Educational Conference and
Exhibition,

Held in December 1926.

EDITED BY

J. E. PARKINSON AND R. H. WHITEHOUSE.

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EDITORS' NOTE.

The proceedings presented in this volume do not form a complete record of all the papers read at the Punjab Educational Conference of December 1926. There are several reasons for this : all the papers read have not been submitted for publication ; many addresses were delivered *extempore* or only from the barest outline notes, and the speakers have not been able to afford the time to write out their remarks in a form for publication ; some addresses were only explanatory of lantern slides ; lastly, a considerable number of papers dealt with commonplace matters which, though appreciated by audiences at the time, would scarcely appeal to readers of this report.

The last General Educational Conference held in the Punjab met in Lahore on the 26th, 27th and 28th April, 1917, under the presidency of The Hon'ble Mr. J. A. Richey, then Director of Public Instruction, Punjab. That Conference was attended by fifty people including educational officials, inspectors of schools, headmasters, missionaries in charge of schools and a number of gentlemen indirectly associated with educational work. The subjects then discussed were mainly concerned with administration and policy. The Punjab Educational Conference of December 1926 was probably the only one of its kind ever held in India. From the first, its aim was far more ambitious than that of the Conference referred to above ; it was intended to be as comprehensive as possible and, as a general rule, to refrain from discussions of questions of administration and policy ; it was expected that the deliberations would be such as to interest directly the teacher in his or her work and also the public in educational matters.

For this purpose, the Conference was modelled on the lines of meetings of the British Association for the Advancement of Science. The papers submitted were classified under sections so that those who attended could choose subjects in which they were particularly interested ; by no other scheme did it seem possible to include in the programme the 206 addresses which were actually delivered during the week chosen for the Conference. Presidential addresses were so arranged as to enable all, if they so desired, to attend them. Upwards of a thousand teachers and others from all parts of the Province attended the Conference and all the sections were well attended, with one regrettable exception—that for co-operation—and this appeared to be due to the fact

that so few realized the intimate connection between the Co-operation and Education Departments.

The Educational Exhibition which was held at the same time and which was such a marked success is dealt with in a note by the Organizer and Secretary of the Exhibition, Khan Bahadur Sheikh Nur Elahi, M. A., I. E. S.

The success of the Conference and Exhibition was due in a large measure to the interest taken in them by His Excellency Sir Malcolm Hailey, Governor of the Punjab, and the splendid co-operation of officials of several Government Departments. Those engaged in educational work in the Province are particularly grateful for the continued encouragement of His Excellency, who throughout his administration has given evidence of his appreciation of the efforts of educationists of the Province to advance education in the Punjab. For the assistance and encouragement from Sir George Anderson, Director of Public Instruction, Punjab, it is impossible to express sufficient thanks ; not only did he willingly accept the office of President, but spared some time every day to attend the Conference and Exhibition. Those of us who know the amount of time and attention his ordinary duties demand can appreciate what that encouragement must have cost him in time ; for him there was, however, compensation in the obvious pleasure it gave him. To express the grateful thanks of the Conference and Exhibition Committee is an inadequate acknowledgment of the ungrudging help given by various Government Departments such as those of Co-operation, Public Works, Forests, Health, Agriculture and Industries. The officers of these departments made it quite clear that their work was intimately associated with that of the teachers in schools and colleges, and the teachers were grateful for the instructive assistance these officers so willingly and ably gave.

Though a perusal of the programme is itself a sufficient proof, it may be as well to emphasize that the Conference and Exhibition was by no means a Government affair only. The share which the private schools and colleges took was no less than that taken by Government institutions ; all shared equally the endeavour to make the venture one of real help and importance.

The expenses of the Conference and Exhibition were met from a Government grant of Rs. 5,000, a sum which must be regarded as modest when we consider that the Conference lasted eight days and the Exhibition was open for a fortnight ; that the Conference was attended by upwards of 1,000 people from all parts of the Province ; that the Exhibition was attended by, roughly, 5,000 people every day. The cost of the publication of this volume has been borne by the Punjab Text-Book Committee, and the Organizing Committee desire to express their gratitude both to the Government and to the Text-Book

Committee for their generosity ; without this help it would have been difficult or impossible to hold the function or to publish the report now presented.

The work of editing has been somewhat heavy and has taken rather longer than was anticipated. It is always difficult to find time for such work in addition to ordinary official duties, consequently delay in publication was inevitable. The papers read were seldom in a form ready for the press and the contributions from some writers needed some revision before publication. When the meaning was not quite clear, we have done our best to interpret, and if any utterances still remain uncertain in meaning, we crave the indulgence both of the author and reader.

J. E. PARKINSON.

R. H. WHITEHOUSE.

A BRIEF NOTE ON THE PUNJAB EDUCATIONAL EXHIBITION.

The first provincial exhibition of which any record is traceable was held in April 1903 and it was indeed a happy thought that brought about another after quite a quarter of a century. The exhibition formed a part of the Educational Conference which held its meetings daily during the first week out of the fortnight the exhibition was open to the public. The exhibition was found to be an essential and an inseparable appendage of the Conference. The reason was simple enough. The discussion of educational theories and principles debated at the Conference could be appreciated only by those who were either interested in the great problem or were taking an active part in the education of the Province. But an exhibition which makes a direct appeal to the senses of sight and touch, would, it was rightly considered, be valued by even the tiro and the layman. The aim of the exhibition therefore was to place before the public in the shape of actual products of the school children, some hard and unassailable facts which could exhibit beyond a shadow of doubt the fast progress and the rapid strides made by the Punjab Schools in the domain of education during the previous decade or two. To the doubting Thomases among the public at large, the fine display of exhibits from our institutions served not only as excellent eye-openers but proved a splendid means of rectifying their obliquity of judgment regarding matters educational. The educator, on the other hand, could, by a careful observation of the exhibits of the other institutions, learn many a new lesson—detect his own weak points, gain inspiration for future lines of action and then develop new ideals.

The exhibition was opened by H. E. Sir Malcolm Hailey, the Governor of the Punjab, on the morning of the 15th December in the presence of a large gathering of educational and other officers and Lahore society. It remained open to the public until the afternoon of December 31, 1926.

A month or so before the formal inaugural ceremony, no one had the faintest idea that the work of arrangement, selection and assortment of the large number of exhibits would turn out to be such a vast concern as was actually realised, when the appointed time approached. The large response made to our appeal for exhibits from the Arts and Industrial Schools, educational firms and from the public at large was most encouraging. So much material was received that it took us several days to make the final selection—many a time to the great disappointment of the senders. The rush upon space by the booksellers and other firms dealing in educational goods, was so large and pressing that we had ultimately to occupy not only all the class rooms of the Central Model School, but, through the courtesy of the Headmaster,

had also to draw upon any empty and unoccupied corner that could be found available for use in the playground or the school compound.

One fact that came home most forcibly to me and my colleagues was assuredly this that the Punjab Schools could compare and compete most favourably and in open field with any similar institutions in any other province of India and that the tiny children of this province possessed marvellously impressionable brains. What they attempted, they did with will and might. And for this, all credit to them and their teachers !

Entering the Model School compound by the eastern gate, there were arranged on the right side of the road, a series of "peeps at many lands" arranged continentwise ; and on the left hand side, were planted large numbers of typical flora and fauna of foreign countries. The verandahs of the buildings adjacent to this road were allotted to the sports and booksellers' stalls. The space between the main school block and the hostel was very usefully employed by the Agricultural Department which kept working all the time some of their latest models and exhibits and improved implements. Coming to the main block, in the hall, could be observed along the walls, the drawing work, classwise, of the different classes of various institutions in the province. The left and right hand side walls of the entrance gate were allocated to the paintings of the children of European Schools. The front wall had on it the works of professional artists and the portion above these was decorated with beautifully painted shields and phulkaries. On the floor were cases containing very ancient manuscripts, illuminated and illustrated with elegant pictures. Besides this all round the walls of the hall were tables with a large amount of manual work, both carpentry, smithy and clay modelling. Some of the articles and designs were wonderfully well made and it did sometimes throw a shadow of doubt across one's mind whether the articles produced were actually the workmanship of our school boys. The paintings and drawings caused one to wonder that there was hardly any drawing done in our schools some 25 years back, to see the surprising progress—a sure symbol of the popularity of the subject, the keenness of teacher and interest of boys—made some of our visitors jubilant at the amazing progress. In two of the side rooms on the right side, were collected the works of the Girls' Schools, exceedingly well arranged and neatly hung up by Miss Stratford, Deputy Directress of the Punjab and her colleagues. In the third room could be seen the graphs, posters and other literature of the Agricultural Department. On the left side the first room was allotted to geographical maps, charts and other instruments and the arrangement was in the clever hands of Prof. Sohan Lal. The next two rooms contained specimens of boys and girls' pen-craft—Hindi, Punjabi, English, Urdu and Arabic. These were

another mine of wonder, for one saw how much could be achieved in the direction by care, thought and pain. Along the walls of the verandah in this block were hung up a very large number of most educative and informing graphical charts prepared by L. Sohan Lal, showing the various details about the progress of education, growth of canals and expansion of forests, etc., in the Punjab. Outside in front of the porch was a most interesting model lent by the P. W. D. Canal Department, of the Sutlej Project and close by it was an actual brick and mortar model of a waterfall, a lake, a river, its tributaries, the valleys and houses round about it, with bridges, viaducts and watermills, telegraph connections, etc. On the left hand of the river was depicted the Simla Hills, with the world renowned railway line, working all the time to the amusement of all the spectators and visitors.

The second block of the school was devoted entirely to educational firms, the verandahs being allotted to book-sellers and the rooms to industrial schools and firms. Here was afforded a unique chance of seeing the wonderful output of the Industrial Schools of the Punjab. These exhibits included nearly all the industries of the province and showed ingenuity and skill. Dr. Whitehouse's interesting method of making science teaching more rational, interesting and living as far as possible and continuous in after-school career could be seen in one of the rooms where a few science teachers were busy all the time in explaining to the visitors the new method and its various devices. The playground was left unoccupied for demonstrations of various school activities such as Mass Drill, Scout Games, Play-for all, and other Indian and Western games. In the evening the same space was utilised for cinema shows of educational films.

It seems impossible to do justice in a short note to any or all of the wonderful exhibits sent by the various institutions, individuals and private bodies. The variety and excellence of the work deserve the highest praise and I can only express my hearty congratulations and thanks to all the senders.

It was apparent from the daily visits of a large number of men and women that the exhibition was very popular and that those who visited the exhibition, went there to learn. It was not an unusual sight to see teachers and others taking brief notes ; and every one seemed keen to learn all that was possible about the exhibits. Visitors were permitted to handle the exhibits lying within reasonable reach. The rooms were crowded at all hours of the day from 10 A.M. to 5 P.M. but the usual noise and confusion were absent, possibly due to the fact that it was an educational exhibition and not a mere show. Even although a small charge was made for admission, yet the approximate number of people who were admitted daily, was counted by thousands.

Pressed as is an inspector of schools with all sorts of emergency duties such as interviews, enquiries and reports besides his usual office routine and files and touring, it will be clear that but for the devoted, conscientious and wholehearted assistance given to me by a large number of gentlemen from the Lahore and other divisions I could not have done what resulted had it not been for their hard work and careful application. To them I owe a deep debt of gratitude as also to many gentlemen who have helped by the exhibits and also by their advice.

The names of individuals and institutions who have won merit in their several exhibits are too numerous to mention here. The work of selection was extremely difficult and any one who has done work of this type will realise that business of the Committee was not a bed of roses. However, I congratulate the winners of certificates and other prizes and also the Judging Committee for having accomplished a most difficult task.

Worthy of special mention among my helpers are :—

1. Mr. P. D. Bhanot, Head Master, Government High School, Amritsar, who as joint secretary assisted me most assiduously all along and held charge of the work during my unavoidable absence from head-quarters.

2. Pir Walayat Shah for his energetic assistance in the work of arrangement.

3. M. Nur Din, Drawing Master, Technical School, for the construction of several models and for the decoration of the hall.

4. S. Dayal Singh for the efficient control of the office work.

I would however be failing in my pleasurable duty were I not to mention the debt of thanks I owe to Sir George Anderson, Director of Public Instruction, Punjab, but for whose able and wise guidance in all matters requiring expert advice and but for whose encouragement, support and financial assistance such a success as was achieved would not at all have been possible in the short time at our disposal. The exhibition owed to him its unqualified success. To Mr. Parkinson also who was ever ready and handy whenever advice was needed, I am grateful for the time he gave me and the suggestions he offered when asked for. To Dr. Whitehouse and L. Sohan Lal of the Central Training College, my thanks are also due for their untiring efforts in looking after and making a success of their Science and Geography Departments.

The exhibition bore eloquent testimony to the enthusiasm of all these gentlemen as well as to the hearty response made by the teachers of the province and to their excellent methods of teaching. Judging by this unique display, the Punjab can well be proud of its amazing educational progress which was the one lasting impression every visitor carried home with him from the Exhibition.

NUR ELAHI,

Inspector of Schools, Lahore Division,

and

Secretary, Punjab Educational Exhibition

Programme.

Wednesday, 15th December.

10-0 a.m.	..	Opening Address	..	..	His Excellency Sir Malcolm Hailey, K.C.S.I., C.I.E., Governor of the Punjab.
2-0 to 4.p.m...		Scouting and Play-for-All Displays.			
6-30 p.m	..	Demonstration of Fruit and Vegetable Preservation	..	..	S. Lall Singh.

Thursday, 16th December.

9-30 a.m.	..	Presidential Address	..	..	Sir George Anderson, Kt., C.I.E., M.A., Director of Public Instruction, Punjab.
		English Section—			
10-30 a.m.	..	Presidential Address	..	..	J. Leitch Wilson, Esq., M.A.
		Mathematics Section—			
11-30 a.m.	..	Presidential Address	..	..	R. B. Lala Atma Ram, M.A., I.E.S.
		History and Civics Section—			
12-30 p.m.	..	Presidential Address	..	..	A. Yusuf Ali, Esq., C.B.E., M.A., LL.M.
		Classical Languages Section—			
2-0 p.m.	..	Presidential Address	..	..	A.C. Woolner, Esq., C.I.E., M.A.
		Physical Education Section—			
3-0 p.m.	..	Presidential Address	..	..	H. W. Hogg, Esq.
		Adult Education Section—			
4-0 p.m.	..	Presidential Address	..	..	K. B. Sheikh Nur Elahi, M.A., I.E.S.
6-30 p.m.	..	Demonstration of Jam Making	..	..	S. Lall Singh.

Friday, 17th December.

9-30 a.m.	..	Co-operation Section— Presidential Address	..	..	C. F. Strickland, Esq., I.C.S.
10-30 a.m.	..	Science and Geography Section— Presidential Address	..	..	H.B. Dunnicliff, Esq., M.A., Sc.D., F.I.C., I.E.S.
11-30 a.m.	..	Arts and Crafts Section— Presidential Address	..	..	L. Heath, Esq., I.E.S.
12-30 p.m.	..	Girls' Education Section— Presidential Address	..	..	Miss L. Stratford, M.B.E., B.A., I.E.S.
2-0 p.m.	..	Vernacular Languages Section— Presidential Address	..	..	K. B. Sir Abdul Qadir, Kt., B.A.
3-0 p.m.	..	Rural Education Section— Presidential Address	..	..	Rev. A. E. Harper, M.A., B.D.
4-0 p.m.	..	Health Section— Presidential Address	..	..	Major J.R.D. Webb, I.M.S.
6-30 p.m.	..	Demonstration of Fruit and Vegetable Drying	..	..	S. Lall Singh.

Saturday, 18th December and Sunday, 19th December.

Excursions were arranged for the following places :—

The Lahore Fort	..	..	..	Leader : Mr. S. M. Munir.
Jehangir's Tomb, Shahdara	..	..	..	Leader : Mr. Sohan Lal.
The Tanning Factory, Shahdara	..	..	..	Leader : Mr. Shinquin.
The Railway Workshops	..	..	..	Leader : Capt. Whittaker.
Resin Factory, Jallo	..	..	..	Leader : Mr. Guest.
Maclagan Engineering College, Moghalpura	..	..	..	Leader : Capt. Whittaker.
Historical Records	..	..	..	Leader : Mr. H L.O.Garrett.
Messrs. R. S. Munshi Gulab Singh & Sons' Printing Works	..	..	..	Mr. E. S. Gaspar.
President of the Conference and Exhibition	{			Sir George Anderson, Kt., C.I.E., M.A., I.E.S., Director of Public Instruction, Punjab.
English Section	..	President	..	J. Leitch Wilson, Esq., M.A., Inspector of Schools, Rawalpindi.
		Secretary	..	Mr. H. C. Sahgal, M.A., B.T.
Mathematics Section	..	President	..	Rai Bahadur L. Atma Ram, M.A., I.E.S., Inspector of Schools, Ambala.
		Secretary	..	L. Guranditta Mall, M.A., B.T.
History and Civics Section		President	..	A. Yusuf Ali, Esq., C. B. E., LL. M., M.A., Principal, Islamia College, Lahore.
		Secretary	..	Mr. S. M. Munir, M.A., B. T.
Classical Languages Section.		President	..	A. C. Woolner, Esq., C.I.E., M.A., Dean of University Instruction and Principal, 'Oriental College, Lahore.
		Secretary	..	P. Gauri Shanker, M.A., B.T.
Physical Education Section		President	..	H. W. Hogg, Esq., Physical Adviser to the Education Department, Punjab.
		Secretary	..	Qazi Ikram Hussain.
Adult Education Section		President	..	Khan Bahadur Sh. Nur Elahi, M.A., I.E.S., Inspector of Schools, Lahore.
		Secretary	..	Maulvi Abdul Hamid, M.A.
Co-operation Section	..	President	..	C. F. Strickland, Esq., I.C.S., Registrar, Co-operative Societies, Punjab.
		Secretary	..	Mr. H. C. Kathpalia, M.A.
Science and Geography Section		President	..	Prof. H. B. Dunncliff, M.A., Sc. D., F.I.C., I.E.S., University Professor of Inorganic Chemistry.
		Secretary	..	L. Ghansham Das, B.Sc., B.T.
Arts and Crafts Section	..	President	..	Lionel Heath, Esq., I.E.S., Principal, Mayo School of Arts, Lahore.
		Secretary	..	P. Vasu Deva Sharma, A.R.C.A.
Girls' Education Section		President	..	Miss L. M. Stratford, M.B.E., B.A., I.E.S., Deputy Directress of Public Instruction, Punjab.
Vernacular Languages Section.		President	..	Khan Bahadur Sir Abdul Qadir, Kt., B.A Barrister-at-Law.
		Secretary	..	M. Zafar Iqbal, M.A., B.T.
Rural Education Section		President	..	Rev. A. E. Harper, M.A., B.D., Principal, Training School for Village Teachers, Moga.
		Secretary	..	Bh. Bhagat Singh, B.A., B.T.

Health Section .. President .. Major J.R.D. Webb, I.M.S., Health Officer,
Simla.
Secretary .. L. Mohan Lal Bhalla, B.A., B.T.

Conference and Exhibition Organising Committee.

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K. B. Syed Maqbul Shah, M.A., I.E.S., Secretary.
Miss Stratford, M.B.E., B.A., I.E.S.

ENGLISH SECTION

Monday, 20th December.

1. 9-30 a.m. .. The Teaching of English in Colleges .. Mr. H. Y. Langhorne.
2. 10-15 a.m. .. The Teaching of English in Secondary Schools .. Mr. Madan Gopal Singh.
3. 11-0 a.m. .. English, Spoken and Written .. Mr. H. C. Kathpalia.
4. 11-45 a.m. .. The Study of English Poetry in the Punjab Colleges .. Mr. S. C. Bhattacharya.
5. 12-30 p.m. .. The Teaching of English .. Mr. D. Reynell.
6. 2-0 p.m. .. Hints on the Teaching of English in Schools .. Pandit Hans Raj Rishi.
7. 2-45 p.m. .. Some Observations on the Teaching of English in Schools and Colleges .. L. Kahan Chand Khanna.
8. 3-30 p.m. .. The Teaching of English Composition .. Pt. Diwan Chand Sharma.
9. 9-30 a.m. .. The Approach to English Literature in Intermediate and B. A. Classes .. Dr. F. M. Velte.
10. 10-15 a.m. .. The Substitution Method in the Teaching of English .. Rev. W. M. Ryburn.
11. 11-0 a.m. .. The Teaching of English Grammar .. M. Ahmad Din.
12. 11-45 a.m. .. Phonetics as an Aid in Teaching English .. Mr. H. C. Sahgal.
13. 12-15 p.m. .. The Practice Method in High Schools .. L. Prakash Lal.
14. 2-0 p.m. .. Common Mistakes in English .. M. Abdul Hamid.
15. 2-45 p.m. .. The Teaching of English Poetry .. Mr. Ugar Sen.

MATHEMATICS SECTION.

Monday, 20th December.

1. 9-30 a.m. ... An Historical Survey of Astronomical and Mathematical Research in Ancient India .. Prof. S. N. Das Gupta.
2. 10-15 a.m. .. Muslim Mathematicians .. Kh. Dil Mohammad.
3. 10-45 a.m. .. Some Famous Geometrical Problems .. Prof. Devi Dyal.

4. 11-30 a.m. .. Lantern Lecture on Constellations and Stories about them .. Prof. G. S. Chawla.
5. 12-30 p.m. .. Motivation in the Earlier Stages of Childhood in Teaching Arithmetic .. L. Guranditta Mall.

Tuesday, 21st December.

6. 6-30 p.m. .. Visit to the University Observatory ..
7. 9-30 a.m. .. The Introduction of Logarithms in the High Classes of Schools .. L. Mehar Chand Suri.
8. 10-0 a.m. .. Graphs in Mathematical Teaching in the Secondary Department .. L. Hari Chand.
9. 10-30 a.m. .. The Teaching of Mathematics in the Primary Department .. L. Behari Lal.
10. 11-0 a.m. .. The Teaching of Mathematics in the Middle Department .. L. Harbans Rai Mehta.
11. 11-30 a.m. .. Mathematics Syllabuses .. Miss. Tomlinson.
12. 12-15 p.m. .. Defects in the Teaching of Mathematics .. L. Guranditta Mall.
13. 2-30 p.m. .. The Study of Mathematics .. B. Bishan Das Puri.
14. 3-0 p.m. .. Music in Infant Mathematics .. S. Bhagat Ram Singh.
15. 3-30 p.m. .. Parallel Straight Lines .. L. Kharati Lal.
16. 4-0 p.m. .. Resolutions.

HISTORY AND CIVICS SECTION

Monday, 20th December.

1. 9-30 a.m. .. The Teaching of History in the Punjab Schools .. Mr. H. L. O. Garrett.
2. 10-15 a.m. .. The Value of Local History .. Pt. Sri Ram.
3. 11-0 a.m. .. The Antiquities of Lahore .. Mr. Ram Chand Manchanda.
4. 12-0 noon .. Civics in Schools .. Mr. S. M. Munir.

Tuesday, 21st December.

5. 9-30 a.m. .. Camping as an Aid to the General Efficiency of Students .. Mr. H. W. Hogg.
6. 10-15 a.m. .. Scouting .. S. Hardial Singh.
7. 11-0 a.m. .. Some Observations on the Teaching of History .. L. Kahan Chand Khanna
8. 11-45 a.m. .. Illustrative Material in the Teaching of History .. Miss E. M. Edward.
9. 12-35 p.m. .. Matriculation History .. Mr. D. Reynell.
10. 12-45 p.m. .. The Teaching of History in High Schools .. L. Ram Chandra.

CLASSICAL AND VERNACULAR LANGUAGES SECTION.

Monday, 20th December.

1. 9-30 a.m. .. The Study of Sanskrit Literature in Schools .. Dr. Lakshman Swarup.
2. 10-0 a.m. .. Urdu Stage .. M. Imtiaz Ali Taj.
3. 10-30 a.m. .. Suggestions for Improvement in the Teaching of Arabic and Persian in Schools and Colleges .. Dr. Muhammad Iqbal.
4. 14-15 a.m. .. Urdu Drama .. M. Muhammad Umar.
5. 12-0 noon .. Philology and the Study of Sanskrit in the Punjab .. Dr. Benarsi Dass.
6. 2-0 pm .. The Renaissance of Urdu Poetry .. Pt. Brij Mohan Dattariya.
7. 2-30 p.m. .. Text-books in Hindi in Schools .. Pt. Gauri Shanker
8. 3-0 p.m. .. The Adaptability of the Urdu Language .. M. Mumtaz Ali.

Tuesday, 21st December.

9. 9-30 a.m. .. The Earliest Version of the Story of Hir and Ranjha .. Q. Fazal-i-Haq.
10. 10-0 a.m. .. The Oriental Home of Urdu .. Hafiz Muhammad Shairazi.
11. 10-30 a.m. .. The Teaching of Sanskrit Grammar .. L. Bishan Das Puri.
12. 11-0 am. .. Students' Vernacular as a Basis for Teaching Arabic .. M. Mohd. Din.
13. 11-45 a.m. .. The Teaching of Sanskrit Grammar in Schools and Colleges .. Prof. Charan Dev.
14. 12-30 p.m. .. Study of Sanskrit in Schools .. L. Veda Vyasa.
15. 2-0 p.m. .. The Short Story in Urdu .. M. Zia-ud-Din Shansi.

PHYSICAL EDUCATION SECTION.

Monday, 20th December.

1. 9-30 a.m. .. Recent Developments in Physical Training in the Punjab .. Mr. J. E. Parkinson.
2. 10-0 a.m. .. Need for Physical Education .. L. Vishwa Nath.
3. 10-30 a.m. .. Posture—Common Faults and their Corrections .. Q. Ikram Husain.
4. 11-15 a.m. .. Physical Training in Montgomery District (Urdu) .. M. Mohammad Din.
5. 12-0 noon .. Major Games in School Physical Training .. L. Chand Kishore.
6. 2-0 p.m. .. Demonstration in General Quickening Exercises and Methods of Marching by P. T. Class, C.T.C.
7. 2-30 p.m. .. Mass Movements and Play-for-All by C. M. School Boys.

Tuesday, 21st December.

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| 8. | 9-30 a.m. | Results of Modern Physical Training Methods | .. | Mr. E. C. Earl. |
| 9. | 10-15 a.m. | Need for Physical Training in Schools and Colleges | .. | Q. Ikram Husain. |
| 10. | 11-0 a.m. | Schools v. Playground (Urdu) | .. | L. Khushi Ram. |
| 11. | 11-30 a.m. | Play-for-All Movement | .. | R. B. L. Atma Ram. |
| 12. | 12-15 p.m. | Resolutions. | | |
| 13. | 2-0 p.m. | Demonstration in Marching; Calisthenics and Games by the Boys of Islamia High School, Sheranwala Gate, Lahore. | | |
| 14. | 2-45 p.m. | Demonstration in Marching and Calisthenics with Band by the Boys of M. B. High School, Mozang. | | |

ADULT EDUCATION SECTION.**Monday, 20th December.**

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| 1. | 9-30 a.m. | Difficulties in Adult Education | .. | M. Najib Ullah. |
| 2. | 10-0 a.m. | How to Popularize Adult Education | | L. Ram Lal Kanwar. |
| 3. | 10-30 a.m. | Some Aspects of Adult Education | .. | M. Mohammad Mohsin. |
| 4. | 11-0 a.m. | Adult Education | .. | M. W. Yamini. |
| 5. | 11-30 a.m. | Management of Adult Schools | .. | L. Suraj Ban. |
| 6. | 12-0 noon | Co-operation and Adult Education | .. | B. Iqbal Singh. |
| 7. | 2-0 p.m. | An Experiment in Adult Education | .. | Bh. Bishen Das Puri. |
| 8. | 2-30 p.m. | Adult Education | .. | M. Jan Mohammad. |
| 9. | 3-0 p.m. | Propaganda | .. | M. Abdur Rasul. |
| 10. | 3-30 p.m. | Education of Adults in the Punjab | .. | S. Jawand Singh. |
| 11. | 4-0 p.m. | Discussion. | | |

Tuesday, 21st December.

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| 12. | 9-30 a.m. | Adult Education (Ver.) | .. | S. Gobind Singh Gauhar. |
| 13. | 10-0 a.m. | Adult Education | .. | L. Bihari Lal. |
| 14. | 10-30 a.m. | Ta'alim-i-Balighan | .. | M. Abdul Rahman |
| 15. | 11-0 a.m. | A Note on Adult Education | .. | M. A. Bari. |
| 16. | 11-30 a.m. | Adult Education (Ver.) | .. | M. Nasir-ud-Din. |
| 17. | 12-0 non | Adult Education | .. | M. Abdul Latif. |
| 18. | 2-0 p.m. | Adults and Their Education (Ver.) | .. | M. Allah Din. |
| 19. | 2-30 p.m. | Propaganda in Rural Areas | .. | L. Labhu Ram. |

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| 20. | 3-0 p.m. | .. | Propaganda .. | .. | K. Naine. |
| 21. | 3-30 p.m. | .. | Adult Education in the Punjab | .. | M. Mohd. Iqbal Shafi. |
| 22. | 4-0 p.m. | .. | Resolutions, etc. | | |

CO-OPERATION SECTION.

Monday, 20th December.

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|----|------------|----|----------------------------------|----|-------------------------|
| 1. | 10-0 a.m. | .. | The Meaning of Co-operation | .. | Inspector Kartar Singh. |
| 2. | 10-45 a.m. | .. | Credit .. | .. | Ch. Izzat Ali. |
| 3. | 11-15 a.m. | .. | Thrift .. | .. | S. Basant Singh. |
| 4. | 12-0 noon | .. | Co-operation .. | .. | L. Ram Lal Kanwar. |
| 5. | 12-30 p.m. | .. | Co-operation, Teacher and Parent | .. | L. Sundar Das. |
| 6. | 2-0 p.m. | .. | Co-operation and Agriculture | .. | K. S. Malik Fateh Khan. |
| 7. | 3-0 p.m. | .. | Supply and Sale .. | .. | Ch. Nawab Ali. |

Tuesday, 21st December.

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| 8. | 10-0 a.m. | .. | Consolidation of Holdings | .. | Khan Barkat Ali Khan. |
| 9. | 10-45 a.m. | .. | Cattle .. | .. | Ch. Abdul Hamid. |
| 10. | 11-30 a.m. | .. | Industries .. | .. | Inspector Manzur Ali. |
| 11. | 12-15 p.m. | .. | "Mushtarka satmaya o bahami imdad
ki Anjumanen" | .. | B. Harnam Singh. |
| 12. | 2-0 p.m. | .. | Co-operation and Moral Improvement
as leading to Self-Government | .. | Inspector Bashir Ahmad. |
| 13. | 3-0 p.m. | .. | The Wise Use of Money .. | .. | S. Lachhman Singh. |
| 14. | 4-0 p.m. | .. | Co-operation and Education | .. | Khan Bashir Ahmad. |

SCIENCE AND GEOGRAPHY SECTION.

Monday, 20th December.

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| 1. | 9-30 a.m. | .. | Geography as an Introduction to
Economics .. | .. | Prof. W. H. Myles. |
| 2. | 10-20 a.m. | .. | The Influence of Elementary Science
Teaching on the Development of an
Orderly Mind | .. | Mr. B. H. Wilsdon. |
| 3. | 11-15 a.m. | .. | Development of Communication in the
Punjab .. | .. | Mr. K. C. Mitchell. |
| 4. | 12-0 noon | .. | Development of Irrigation in the
Punjab .. | .. | Mr. E. S. Lindley. |
| 5. | 2-0 p.m. | .. | The Teaching of Physiology and
Hygiene in Schools .. | .. | Mr. B. L. Bhatia. |
| 6. | 2-45 p.m. | .. | The Distribution of Plants in the
Punjab .. | .. | L. Mohan Lal Sethi. |
| 7. | 3-15 p.m. | .. | The Teaching of Agriculture in Schools | | L. Lachhman Das. |

8. 4-0 p.m. .. Possibilities of Plantations .. Mr S. Bannerjee.
 9. 6-30 p.m. .. Simple Dynamos .. M. Abdul Aziz Sair.

Tuesday, 21st December.

10. 9-30 a.m. .. The Teaching of Science to Women .. Miss S. M. Harrison.
 11. 10-0 a.m. .. New Movements in the Teaching of Geography .. L. Sohan Lal.
 12. 10-30 a.m. .. Individual Teaching in Science .. Dr. R. H. Whitehouse.
 13. 11-0 a.m. .. The Connection between History and Geography .. Rev. Ross Wilson.
 14. 11-30 a.m. .. The Teaching of Science in Middle Schools .. R. S. L. Rattan Lal.
 15. 12-0 noon .. The Effect of Weather on Agriculture L. Ram Dass.
 16. 12-30 p.m. .. Specialization in Science in the High School .. L. Girdhari Lal.
 17. 2-0 p.m. .. Tanning .. Mr. C. A. Shinquin.
 18. 2-30 p.m. .. Suggestions for the Teaching of Nature Study in Schools .. Prof. G. Matthai.
 19. 3-0 p.m. .. The Value of Stamps Collecting .. Mr. G. S. Jaura.
 20. 3-15 p.m. .. The Assignment System in Teaching Science .. L. Sohan Lal Khosla.
 21. 3-45 p.m. .. The Place of Geography in Education L. Ram Autar.
 22. 4-0 p.m. .. Teaching of Geography in Primary Classes .. S. Balwant Singh.

Wednesday, 22nd December.

23. 10-0 a.m. .. Demonstration of the Assignment Method of Teaching .. Central Model School.

ARTS AND CRAFTS SECTION.

Monday, 20th December.

1. 9-30 a.m. .. The Place of Manual Training in Schools .. L. Hardyal Chopra.
 2. 10-0 a.m. .. Arts and Crafts—The Place in General Education .. Mr. Cowie.
 3. 10-30 a.m. .. Teaching of Drawing and Manual Work in Normal Schools .. Bh. Bishan Das Puri.
 4. 11-0 a.m. .. Handwork in Schools .. L. Hari Ram.
 5. 11-30 a.m. .. Vocational Training—A Plea for the Revision of our Present Curriculum B. Udham Singh.
 6. 12-0 noon .. Handicraft in Schools .. P. Vitasta Prasad.
 7. 2-0 p.m. .. Manual Training in Schools .. Sh. Feroze-ud-Din.
 8. 2-30 p.m. .. Drawing as an Aid to Culture (Vernacular) .. M. Ahmad Din.

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| 9. | 3-0 p.m. | .. | Manual Training Scheme for High Schools | M. Nabi Bakhsh. |
| 10. | 3-30 p.m. | .. | Drawing as a Basis of Arts and Crafts Training, Suggestions for Improvement | P. Vasu Deva Sharma. |
| 11. | 4-0 p.m. | .. | Indian Painting | M. Nur-ud-Din Nur. |

Tuesday, 21st December.

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| 12. | 10-0 a.m. | .. | The Desirability of Vocational Training | L. Mahesh Das. |
| 13. | 10-30 a.m. | .. | Education and Unemployment (Ver-nacular) | L. Raghunandan Sahai Gupta. |

GIRLS' EDUCATION SECTION.

Monday, 20th December.

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|-----|------------|----|---|------------------------------|
| 1. | 9-30 a.m. | .. | Inspection | Miss Bhan. |
| 2. | 10-0 a.m. | .. | Higher Education | Miss G. Harrison. |
| 3. | 10-30 a.m. | .. | Primary Education | K. B. S Maqbool Shah. |
| 4. | 11-0 a.m. | .. | College Education Abroad | Mrs. Matthai and Mrs; Kapur. |
| 5. | 11-30 a.m. | .. | Special Schools | Miss Neve. |
| 6. | 12-15 p.m. | .. | The Main Aim of Education of Girls | Miss Edwards. |
| 7. | 2-0 p.m. | .. | Curriculum for Primary Schools | Prof. Ruchi Ram Sahni. |
| 8. | 2-45 p.m. | .. | Individual Work | Miss Lyon. |
| 9. | 3-30 p.m. | .. | Music, Class Singing Rhythm | Miss J. Martin. |
| 10. | 9-30 a.m. | .. | Training of Teachers | Mrs. Sircar. |
| 11. | 10-0 a.m. | .. | Training of Teachers | Mrs. Mossamdar. |
| 12. | 10-30 a.m. | .. | Religious Education | Mrs. Nanak Chand. |
| 13. | 11-0 a.m. | .. | Religious Education | Mrs. Raja Abdul Aziz. |
| 14. | 11-30 a.m. | .. | Oriental Learning. | |
| 15. | 12-0 noon | .. | Health of School Girls. | |
| 16. | 12-30 p.m. | .. | Libraries for Children | Mrs. Harper. |
| 17. | 2-0 p.m. | .. | Women's Educational Meeting at the Y.W.C.A., Abbott Road. | |

RURAL EDUCATION SECTION.

Monday, 20th December

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|----|------------|----|--|-----------------------|
| 1. | 9-30 a.m. | .. | Compulsory Education | Rev. F. B. Llewellyn. |
| 2. | 10-0 a.m. | .. | Rural Education and Community Work | S. Jodh Singh. |
| 3. | 10-30 a.m. | .. | How to Start Community Work | L. Duni Chand. |

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| 4. | 10-45 a.m. | .. | Modern Rural Conditions in Europe and America | .. | .. | Rev. Dr. E. D. Lucas. |
| 5. | 11-15 a.m. | .. | Service for the Rural Community | .. | .. | L. Ram Lal Kalra. |
| 6. | 11-30 a.m. | .. | Community Work | .. | .. | S. Baba Singh. |
| 7. | 11-45 a.m. | .. | The Rural Community and the Teacher | .. | .. | S. Balwant Singh. |
| 8. | 12-0 noon | .. | The Project Method for Village Children | .. | .. | Miss M. J. R. Macdonald. |
| 9. | 2-0 p.m. | .. | Joint Meeting with the Adult Education Section. | | | |

Tuesday, 21st December.

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|-----|------------|----|---|----|----|------------------------|
| 10. | 9-30 a.m. | .. | The Rural School and the Rural Teacher as Regenerating Forces for the New Rural Order | .. | .. | Mr. Behari Lal. |
| 11. | 10-0 a.m. | .. | The Village School in the Service of Agriculturists | .. | .. | Dr. Mason Olcott. |
| 12. | 10-30 a.m. | .. | Rural Community Work | .. | .. | Mr. Brayne. |
| 13. | 11-0 a.m. | .. | The Privilege and Opportunity of the Rural Teacher | .. | .. | L. Ram Lal Kanwar. |
| 14. | 11-15 a.m. | .. | Training of Teachers for Rural Work | | | L. Hardayal. |
| 15. | 11-45 a.m. | .. | The Teaching of Agriculture and Community Work in Schools | .. | .. | L. Lachhman Das Varma. |
| 16. | 12-15 p.m. | .. | Preparing the Teachers for Community Work | .. | .. | B. Hira Singh. |
| 17. | 12-45 p.m. | .. | Revision of the Rural Curriculum | .. | .. | M. Sultan Ahmad. |
| 18. | 2-0 p.m. | .. | Training Rural Teachers for Community Work | .. | .. | S. Sohan Singh. |
| 19. | 2-30 p.m. | .. | Revision of the Normal School Syllabus to prepare Teachers for Community Work | .. | .. | Mr. Parkinson. |
| 20. | 3-0 p.m. | .. | Community Work in the Panjab (Lantern Lecture) | .. | .. | Mr. Brayne. |

Wednesday, 22nd December.

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| 21. | 10-0 a.m. | .. | Rural Community Work | .. | .. | S. Gopal Singh. |
| 22. | 10-30 a.m. | .. | The Teaching of Agriculture in America | .. | .. | S. Lal Singh. |
| 23. | 11-0 a.m. | .. | Discussion and Findings. | | | |

HEALTH SECTION.

Monday, 20th December.

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|----|------------|----|--------------------------|----|----|-----------------------|
| 1. | 9-30 a.m. | .. | Health of Students | .. | .. | Dr. Prem Nath Suri. |
| 2. | 10-0 a.m. | .. | Food and Growth | .. | .. | Miss Simon. |
| 3. | 10-45 a.m. | .. | Septic Tank Arrangements | .. | .. | Mr. P. Carter Speers. |

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| 4. | 11-25 a. m. | .. | Malaria | .. | .. | Dr. Harnam Singh Bhalla. |
| 5. | 11-45 a. m. | .. | Health Teaching in our Schools | .. | .. | Mr. B. L. Bhatia. |
| 6. | 12-30 p.m. | .. | Health of School Children | .. | .. | L. Mohan Lal. |
| 7. | 2-0 p. m. | .. | Tuberculosis | .. | .. | Dr. Maharaj Krishan Kapur. |
| 8. | 2-45 p. m. | .. | Degeneration of School Children—
Physical and Moral. The Disease
and Remedies | .. | .. | Dr. Jamna Das. |
| 9. | 3-30 p.m. | .. | Health Propaganda by Primary Schools
Teachers in Rural Areas | .. | .. | Bawa Barkat Singh. |

Tuesday, 21st December.

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| 10. | 9-30 a. m. | .. | Methods of Health Improvements | .. | .. | L. Diwan Chand. |
| 11. | 10-0 a. m. | .. | Epidemics and our Microscopic Foes | .. | .. | Dr. S. N. Rozdon. |
| 12. | 10-45 a. m. | .. | Eye Trouble among School Children | .. | .. | Dr. Sohan Singh. |
| 13. | 11-0 a.m. | .. | Science of Breathing | .. | .. | Dr. J. N. Luther. |
| 14. | 11-30 a. m. | .. | Possibilities of Service for School Stu-
dents in the Domain of Health | .. | .. | Pt. Bishan Das Sharma. |
| 15. | 12-15 p.m. | .. | Health in Education | .. | .. | Dr. Bose. |
| 16. | 2-0 p. m. | .. | How to Improve Village Sanitation | .. | .. | L. Vishnu Das. |
| 17. | 2-30 p. m. | .. | School Dispensaries | .. | .. | Mr. N. K. Sirkar. |
| 18. | 3-0 p. m. | .. | Medical Inspection of School Children
(Cinema) | .. | .. | Major J. R. D. Webb. |

GENERAL.

Wednesday, 22nd December.

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|----|------------|----|---|----|----|-----------------------|
| 1. | 9-30 a.m. | .. | Mental Fatigue | .. | .. | L. Guranditta Mall. |
| 2. | 10-0 a.m. | .. | Demonstration Lessons in Mathematics,
Science, Geography and English at the
Central Model School. | .. | .. | |
| 3. | 10-30 a.m. | .. | Educational Ideals | .. | .. | Mr. G. N. Chatterjee. |
| 4. | 11-30 a.m. | .. | Music for All | .. | .. | Mr. K. L. Rallia Ram. |
| 5. | 12-30 p.m. | .. | Montessori Apparatus, Demonstrations | .. | .. | M. Fazal Hussain. |

OPENING ADDRESS.

BY HIS EXCELLENCY SIR MALCOLM HAILEY, K.C.S.I., C.I.E.,
Governor of the Punjab.

We make to-day an important departure from the usual procedure of our Educational Conferences. Hitherto, the Conference has emphasized the administrative and to some extent the political aspects of education. To-day we have a double purpose : to show *first*, what is done in the school ; and *second*, perhaps even more important, what the Department is doing outside the school. The first of these objects we endeavour to attain by the exhibition of school work, and by lectures and discussions which will not only bring teachers into contact with each other, but bring the public into closer touch with their work. Important teaching problems will be reviewed and discussed ; we shall have demonstrations of improved methods in physical training ; the students of the Central Training College under the guidance of different professors will teach classes of school children in what is believed to be a new and better method of instruction ; there will be a demonstration of the Montessori method ; and you will be told all about that interesting departure in tutorial procedure, the new " assignment system " introduced by the Principal of the Central Training College.

All this is important, but as I have said, I believe that still more important is the evidence which the Conference will offer of the activity of our educationists in matters hitherto regarded as lying outside the curriculum of the schools. Let me here expand a little. Every period has its distinctive mark, though it is often left for history to determine its exact character. I have no doubt that history will find the characteristic mark of the present day Punjab in the widespread desire for the expansion of education. The figures of recent expansion have often been given to the public, but I do not hesitate to repeat them. Since 1920-21 the number of boys in our schools has increased from half a million to just over a million ; our yearly addition may roughly be put at 100,000 boys. In dealing with this expansion highly important questions both of general and educational policy have inevitably arisen.

Let me take the first. I have on other occasions expressed a conviction, which I must here repeat, that this expansion, satisfactory as it may be in mere numbers, will be of little real use to us, unless we can redress the undue preponderance of boys in the lowest classes. Schooling limited to the lower stages is not education ; it hardly even amounts to the removal of illiteracy. We must concentrate on the expansion of the Middle rather than the Primary School ; we may reasonably hope that a few years will see the final extinction of the one-teacher primary school and the substitution of middle schools with branch primaries under them. Unless we can effect a voluntary change in the school-going habit

which will lead to a prolongation of school life, the statutory measures, prescribing a definite school-going period, will become inevitable. It is the expansion of primary education on these lines which at the moment, and I think rightly, preoccupies the attention of the Ministry. There is a second point. We are, I think, at the moment bound in order to secure uniform advance in the Punjab, to direct our efforts and to utilize our resources largely to the removal of illiteracy in our rural areas and the more backward districts of the Province. In allotting grants for primary education, in provincialising High Schools, in the institution of Intermediate College, we are compelled to keep this object prominently in view. In order to make education more congenial to the backward areas, we are bound to see that as far as possible, teachers should be taken from such areas, and employed as far as possible in the vicinity of their homes. I regard the striking success of the co-operative movement as largely due to the fact that the establishment of the department has mainly been taken from the classes to which that movement chiefly appeals. The policy has been criticized on grounds based partly on communal considerations; but when the heat of communal feeling has abated, I hope that it will be recognized that it did not originate in any desire to favour any one particular class or section, but was based on a wider aim, and has been pursued fairly and reasonably with no other motive than to serve that aim.

But now let me approach a third point, transcending in importance the immediate sphere of departmental direction of policy. Some time ago, in addressing the Legislative Council, I suggested that the need of the day lay not merely in the expansion of education (for that is coming about almost automatically), but even more in the vitalizing of education. Frankly, in spite of the growth that we have witnessed of recent years, I think that few of us would feel that education has exerted on the minds of the people at large that general stimulus, at once an awakening and a broadening of the mind, that we could have hoped to see. There is a general enthusiasm for the spread of schooling; yet paradoxically and unfortunately, people at large seem doubtful whether schooling in itself confers any lasting benefit on the scholar. I have often attempted in conversation with less educated members of the people to arrive at the exact reason which prompts their demand for more educational openings for their children. Schooling is necessary if they are to secure Government employment: that is the first ground, one of obvious and undeniable truth. Education again is necessary if the countryman is to compete with the townsman; it is necessary if the debtor is to be able to deal on equal terms with the creditor; it is necessary if a boy is to get on in the Army. All this one can concede; but one looks for something more; and it is when searching for that something more that one encounters the expression of a lurking feeling of regret that it should be necessary to adopt this somewhat mysterious device to hold one's own in the world; one finds even a feeling that the world would possibly

be a better world if a man did not have to subject his children to a process which, for other purposes, seems to possess no very marked benefits of its own. You will understand that I am speaking of the ordinary man, and not of those families in which education is an instinct or a tradition. And I doubt whether we shall attain real success in education until we can persuade the ordinary man to take a new view of its value. It will make real progress when the trader believes that it will make his son a more alert man of business, the agriculturist is convinced that his son will be a more skilful and energetic cultivator, when in short it is a general belief that education gives a man a better outlook and equipment in every sphere of life. I am not placing the ideal too high and purposely state it in practical and even commonplace terms. That change may require a very considerable modification in current educational practice and curricula, and it is a problem which is now engaging much of the attention of our educationists.

But meanwhile, we are doing our best to give a new and more vital aspect to education by making it more comprehensive ; that is to say, we are attempting to bring it more closely into line with the many activities which should tend to develop the community and encourage a growth of citizenship. We hold that the school should be intimately associated with such matters as co-operation, health, agriculture, and industries. That means, in the first place, that we must give a new outlook to the teacher ; in the second, we must give to the school a new place in the life of its locality. We have endeavoured to emphasize this in the programme of this Conference ; and are greatly indebted to those whom Mr. Parkinson and Dr. Whitehouse have persuaded to bring their experience and enthusiasm for their own lines of work to the assistance of the Educational Department. Mr. Yusuf Ali will address you on Civics ; Mr. Strickland on Co-operation ; Mr. Harper on Rural Education ; Major Webb on Health ; Mr. Hogg on Physical Welfare ; Mr. Heath on Arts and Crafts ; Mr. Blaschek on Forests ; Mr. Mitchell on Communications ; Mr. Lindley on Irrigation ; Mr. Ram Dass on the Effect of Weather on Agriculture ; Mr. Brayne on Rural Community Work. I mention only a few names : if I select these out of the many to whom the Department must express its obligations it is because I find in these names the best illustration of the activities in which we desire the teacher to interest himself and his pupils.

And now let me say one word more. Dealing as we do both in politics and administration with figures in the mass, and with the policy of a great organisation as a whole, one is perhaps apt at times to forget the individual unit. Here that unit is the living boy or girl. I have seen them in their thousands, perhaps in their hundreds of thousands, throughout the province. I have seen them in the schools and at their play, and on the roadside where it is their kindly custom to come and greet me. They are

the raw material on which a great department works ; but more than this, they are individuals, each with his own character, each with his own share of virtues and original sin, each with his own hopes and ambitions, each separately and individually handed to our care to develop and to mould. So high is that task that its direction would almost seem to demand men of loftier ideals and a more apostolic nature than we are wont to associate with a State Department. But the burden has fallen on us, and it must be discharged with all the breadth of vision, all the devotion, all the sympathy and consideration for the individual that we can summon for the task. In that high duty, I wish you all God-speed, and if I may add a word of counsel, I find it in the wise words of Mathew Arnold—"Remember that what attaches men to us, and gives us our hold on their lives is not the machinery we employ, but the spirit we are of."

PRESIDENTIAL ADDRESS.

BY SIR GEORGE ANDERSON, Kt., C.I.E., M.A., I.E.S.

It is a great privilege to have been invited to give an address this morning, and I therefore regret all the more that I cannot do justice either to my subject or to my audience. My only excuse is that since I came down from Simla I have been constantly on tour, I have traversed the sandy plains of Mianwali and crossed the Indus with Mr. Wilson ; I have viewed the rural beauties of Patto Hira Singh with the Sardar Bahadur ; I have explored distant and attractive places in the Multan Division with Chaudhri Fateh-ud-Din, and I have spent a day of crowded life and experience at Ghakkar with our friend, Mr. Sanderson, whom we all welcome back on his return from leave. And after the New Year, I hope to visit the Ambala Division with the Rai Bahadur. I would take this opportunity again to congratulate him and Shaikh Nur Elahi on the titles which have recently been bestowed upon them. Indeed, such as has been the extent of my touring that a Director of Public Instruction may be defined as one who does a minimum of work and a maximum of talking in the short intervals between long periods of touring. I wish to thank all those concerned for their great kindness and forbearance to me during my prolonged and worrying visits. To myself, however, touring is a great joy in spite of its hardships because wherever I go, I witness a growing enthusiasm for education. Moreover, I have the comforting feeling that in my absence the work of the Department is being carried out by our conscientious and loyal friend, Mr. Reynell, with far greater despatch and competence than had I been present.

I must needs make a second apology. In what I am going to say to you this morning there will be little, if anything, that is new as I shall traverse the same ground and express opinions very similar to those which I have expressed on many previous occasions. Indeed, as I pondered over this formidable looking

document, I was irresistibly reminded of some delightful verses which Mr. Godley (not my illustrious predecessor, but his very witty brother who was for many years Public Orator at Oxford) wrote in memory of his lectures which, unrevised and unaltered, had done good and yeoman services year after year to successive audiences of undergraduates who thronged his lecture room at Magdalen.

AD LECTIONEM SUAM.

When Autumn's winds denude the grove
 I seek my Lecture, where it lurks
 'Mid the unpublished portion of my work,
 And ponder, while its sheets I scan,
 How many years away have slipt,
 Since first I penned that ancient manuscript,
 I know thee well — nor can mistake
 The old accustomed pencil stroke
 Denoting where I mostly make
 A joke,—
 Or where coy brackets signify
 Those echoes faint of classic wit
 Which, if a lady's present, I
 Omit.
 Though Truth enlarge her widening range,
 And knowledge be with time increased,
 While thou, my Lecture ! dost not change
 The least.
 But fixed immutable amidst,
 The advent of a newer lore,
 Maintainest calmly what thou didst
 Before,
 Though still malignity avows
 That unsuccessful candidates
 To thee ascribe their frequent ploughs
 In Greats.
 Once more for intellectual food
 Thou'lt serve : an added phrase or two
 Will make thee really just as good
 As new :
 And listening crowds that throng the spot
 Will still as usual complain
 That " Here's the old familiar rot
 Again !"

A few words are necessary about the work, in hand, the Exhibition and the Conference which were opened yesterday by His Excellency the Governor of the Punjab. I would therefore voice your thanks and mine to those who have contributed to the success. The number of those who have done so are legion and indeed an undertaking such as this can be successful only if it receives the active support of the rank and file among the teachers and pupils in the thousands of schools which are now scattered broadcast over the length and breadth of this great province. Those who are responsible will cordially agree with me that they have received that support. In this as in all other undertakings in life enthusiasm is a most valuable asset in the achievement of success, but at the same time enthusiasm, unless it is well controlled and wisely directed, may lead us into dangerous paths. In saying this, my memory takes me back many years to the time when, as a college professor in Bombay, I gave as a

subject for an essay to the first year students the word "Enthusiasm." I remember well one of the essays which I received; and the gist of it was as follows: "One day, I happened to go to the notice board, and read that a science society was to be formed. A meeting would therefore be held for the purpose, and all enthusiasts were invited to be present. Although I could not claim to be an enthusiast in any way, I attended the meeting. There were certainly signs of such enthusiasm and excitement. The professor in charge then entered the room, and the enthusiasm increased. He then stated that the meeting would proceed to elect the office-bearers of the new society. By this time, enthusiasm had reached fever point. But when the office-bearers had been appointed, all enthusiasm vanished. This is false enthusiasm." Thus wrote my young friend, and there is much worldly wisdom in what he said.

It is therefore fortunate that, in the matter of this Exhibition the enthusiasm of the many has been wisely directed by the Central Committee at headquarters. We are therefore most grateful to Miss Stratford; to Khan Bahadur Shaikh Nur Elahi who is mainly responsible for the Exhibition; to Mr. Parkinson and Dr. Whitehouse who are mainly responsible for the Conference; and to Khan Bahadur Syed Maqbul Shah who has acted as Secretary to the Organising Committee.

There is another aspect of the Exhibition and the Conference to which I would refer, I have often tried to explain to you that Education is a most absorbing subject but that it is also a most difficult and complex subject because it is linked to, and bound by, forces over which it has little or no control. Such forces include the abject poverty of many a home. I am therefore glad to find that there is a Co-operation Section, and that Mr. Strickland and other experienced authorities will explain to us the working and the importance of co-operative societies in relieving the people from debt and in building up a thrifty and a provident community. The encouragement of thrift and co-operative societies among our teachers and pupils in such a way as will impress upon them the value of these principles, is therefore a most important part of our duties. I am glad also that the organisers of the Conference have stressed the importance of agriculture in a properly devised system of education. Another problem which faces us is the inadequate means of communications. It is therefore a particular pleasure to welcome here Mr. Kenneth Mitchell who is so great an authority on this vital subject. It is possible that in his weaker moments as he surveys the ever-increasing figures of educational expenditure Mr. Mitchell may be tempted to regard education as the enemy of improved communications, but I am confident that he resists that temptation when he realises (as we also should realise) that improvement in education and improvement in communications are closely interlocked and that the success or failure of the one

reacts inevitably on the other. Another of our problems is the persistence of disease, especially of malaria. We therefore offer a cordial welcome to those who are taking part in the Health Section, for their interests and our interests are in common with each other. Education cannot prosper if the majority of the pupils are sick, and the Health authorities can only succeed in their endeavours if the people are sufficiently educated to understand the benefits of improved sanitation. We are particularly glad to see in our midst Dr. Bose and Miss Simon, who have done so much for the improved health of Indian women. The latter is one of our most enthusiastic lecturers. And then there are the conditions which regulate human life and relationship. If our system of education is to be effective, if it is to make an appeal to the parents and pupils of the province, it is essential that we should study those conditions of life and take steps to ensure that the application of our teaching is in harmony with those conditions, and especially with the conditions of those millions of people who live in rural areas. An interesting feature of the Conference, therefore, are the Rural and Adult Education Sections, in which are included papers by many experienced authorities.

Before passing on from this vital subject which is generally known as Community Work, I am tempted to tell you a story from the pages of history, and then to ask you a question which I find it somewhat difficult myself to answer. I am nervous of doing so because my history was always erratic and is now very rusty. Besides, I see the eagle eye of my friend, Mr. Garrett, fixed upon me. After the death of Louis XIV of France, there was a long minority, and the Regent was the Duke of Orleans. To sum up his career and his character has been a baffling problem to the historian. Everything seemed to be in his favour. He was of ancient and royal lineage; he had physical strength and beauty; he had wealth; he had intellect; and he had strength, for, during the long and successful reign of the old king, France had reached the zenith of her power. Yet the Regent Orleans ranks as one of the world's great failures. Had he been vicious or wicked his failure would have been intelligible, but he was not so. He failed, and he failed miserably, merely because he was a nonentity. The story of his failure is as follows: We Christians have a ceremony called Christening, when an infant child is admitted to the Church of Christ. It is, as you would expect, a time of great rejoicing; and the friends and relations of the child attend, each bearing with him a gift. At the Christening of the Regent Orleans, there were many illustrious guests. One brought the gift of health; another the gift of wealth; another the gift of power; another the gift of learning; and yet another the gift of strength. All were congratulating the happy parents and were telling them what a great man the child would be, when an ugly old woman entered the room. She asked why she had not been bidden to the feast. When she was told that she had

been forgotten, she replied : " Then he shall not have my gift, which is the gift to use his gifts."

And this leads me to my question. This Exhibition and this Conference, even of themselves, show that we are showering gifts of many kinds on the boys and girls of this province, but are we sure that we are also giving them the gift to use those gifts ? Are we sure that our system of education is sufficiently in harmony with the conditions in which the pupils live and have their being ? Are you sure that our lessons and our training are such as will exercise a salutary and a permanent influence on the pupils after they leave school and enter upon their several occupations ? This seems to me to be the real problem of education, and we must be prepared to solve it. There are some who think that salvation lies in what is generally known as vocational training. We should turn our pens into ploughshares, and we should substitute vocational instruction for general learning. But surely, to be successful, all vocational training, and still more all professional training, should be based on a sound and a suitable measure of general training. By all means let us have industrial schools, agricultural schools and so forth, but in the right stage and in the right place of our educational system ; and our general training should be such as will lead the boys towards, and not away from these vocational institutions and from practical work and occupations. My answer to the problem therefore is that we should base our system of education on community work, and that by this means education will take its rightful place in the uplift of the whole community. By this means also our general training will be enriched, and will become more real in the eyes of the pupils. It is surely right that our boys and girls should be given lessons, and in the most practical way that is possible, in the value of co-operative principles, in the laws of health and sanitation, in the meaning and import of agriculture, in the elementary science of civics and administration. And why, again, do we persist in putting between inverted commas such words as " Play-for-all", " Food-for-all," " Music-for-all." " Gardens-for-all" as though they were some new things ? We should rather substitute (without the inverted commas) Work-for-all, and have done with it by recognising that all these activities form an essential and an integral part of our general training. Let this Conference, with its varied and stimulating programme, be the outward and visible sign of the inner and spiritual grace which, I hope, is within us.

Unfortunately, the inner and spiritual grace, though excellent in itself, is insufficient of itself to achieve success. If we seek to be practical in our teaching, we must also be practical and business-like in making our preparations. How then are we to carry out the Gospel of the New Learning ? There are some who tell me that the task is easy. " Revise your courses and curricula, place mighty contracts with publishing firms for new text-books

and readers, and all will be well." I do not believe it. We have recently simplified and, I hope, improved our courses, and my publishing and literary friends inform me in season and out of season, that there are large numbers of excellent books which are only awaiting the approval of the Text-Book Committee to win eternal fame. Besides, what is the use of revised courses and text-books unless the teacher understands the spirit which underlies them? It is the spirit and the application of our teaching which matters. We should be careful that the course and the text-book are our servants and not our masters. I therefore agree with my friend, Mr. Sanderson, who has given much thought and time to this matter, that we should begin with the teacher and end with the text-book. The seed of a more suitably trained teacher, whose training is based on community work, was sown by the American Presbyterian Mission some years ago at Moga, and it is therefore a happy choice that our friend Mr. Harper is the president of the Rural Section. And now we have seen the blade appearing above ground, for all our training institutions, to a greater or a lesser degree, are now striving to give this fuller and richer training to the teachers of the future. First and foremost is the Central Training College, which extends its hope and activities almost every day under the inspiring guidance of Mr. Parkinson and Dr. Whitehouse. One of its most pleasing and hopeful innovations is the specialised class in physical training which has just been started under the direction of Mr. Hogg. Among the vernacular training institutions, it has been customary to place in the forefront of the battle those at Gurgaon and Ghakkar. We are glad therefore to see Mr. Brayne and L. Har Dyal Chopra from Gurgaon, and B. Sohan Singh from Ghakkar, but I can assure them that there are other institutions which will not concede to them the supremacy. During the present cold weather, Mr. Sanderson will visit all these training places and we can rest assured that some effective measures will result from those visits. There is no more important work to be done in education than to ensure that from the seed that was sown at Moga shall come first the blade, then the corn, and then the full corn in the ear.

May I also ask another question in regard to the sad precedent of the Regent Orleans? In recent years, through the liberality of the Punjab Government, great improvements have been made in our educational buildings, in the equipment and in the surroundings of our schools and colleges. I would therefore ask those who are in charge of our schools and colleges whether they have always the inclination and the capacity to use those gifts to the fullest extent. The successful headmaster is he who constantly reviews his material resources, and is ever trying to extend their scope by the introduction of some new development. The successful inspector is he who rarely leaves a school without giving some suggestion whereby the resources of the school shall be put to some fuller use. The successful headmaster

will not complain, as some do, that the effective teaching of science is embarrassed by the lack of material; he will make the material himself. He will not regard the science equipment which is provided as so many exhibits in a museum, locked safely in an almirah and open only to the gaze of the pupils from outside. We should remember the fate of him who stored his talent in a napkin and buried it underground. Our successful headmaster will also see that his school compound is kept neat and tidy and brightened by trees and flowers. "Trees and flowers for all" should certainly be a part of our educational system. In this connection, I would suggest that each school might keep one day in the year sacred to the worship of natural beauty as an Arbor Day, when the boys might be encouraged to plant trees and flowers and to tend them for the remaining days of the year.

I have already exhausted my time and your patience, but there is one important matter which I cannot leave undiscussed. In the course of my remarks, I shall give a few figures and statistics, but far more informing are the excellent graphs which have been prepared by L. Sohan Lal of the Central Training College, and which are on view in the Exhibition. I am most grateful to L. Sohan Lal for his most devoted and efficient help. I shall now make a few remarks on the expansion of education. During the last five years, our enrolment has risen from 556,000 to 1,062,000, or an increase of 506,000 pupils. In his report for 1924-25, Mr. Richey estimated that it would take India forty years at the present rate of expansion to reach the goal of universal education for boys. In accordance with Mr. Richey's basis of calculation, I am glad to say that it will take the Punjab only eleven years, and the more modest and reasonable aspiration of including only 80 *per cent.* of the boys of school-going age in our schools should be realised within a period of six years. So far as the mere pace of expansion is concerned, therefore, the Punjab is in a fortunate position. The largely increasing numbers and the improved attendance of adults in our night schools indicate at any rate that the so-called apathy of the masses is being broken down. Our real danger is that we shall be lulled into a feeling of apathy and self-satisfaction by the lure of numbers. Our test of progress, therefore, should be the reduction of illiteracy rather than the increase in enrolment.

It is at this stage that L. Hari Das with his statistics and L. Sohan Lal with his graphs come to our rescue with a solemn word of warning. Our position is by no means satisfactory. In March last, there were as many as 409,000 pupils in the first class, 140,000 in the second, 93,000 in the third, and only 73,000 in the fourth. If any one among us is in danger of temptation by the sin of self-satisfaction, let him examine these figures and, above all, let him read a most stimulating and thoughtful book on education which has recently been written by my old friend and school

fellow, Mr. Mayhew. This writer finds the effect of our education so disappointing that he concludes that India is too poor a country to afford any further extension of vernacular education which is based solely or mainly on the voluntary principle. He therefore pins his faith on the systematic and widespread application of compulsion as the only remedy. He estimates the cost per literate in India at Rs. 240 under the voluntary system, while the cost per literate under the compulsory system would average only Rs. 60. He concludes : " When we consider the millions in India who have to be raised to literacy, the difference in cost becomes appalling. "

Though I agree with Mr. Mayhew in his main conclusion on the advantages of compulsion I still feel that he is unduly pessimistic. In spite of the manifold obvious disadvantages of the voluntary system, we have made some improvements. In the first place, I must record my emphatic opinion that the single-teacher school is well nigh useless, if not actually harmful, to the reduction of illiteracy. It is satisfactory to learn that the number of these schools which was nearly 3,000 in 1922, is now only about 500. A far more satisfactory substitute is the Branch School. A school of this type has no separate existence as it forms part of the parent school which is only a short distance away. It comprises only one or two classes for the benefit of the younger children until they are old enough to walk to the main school. Thus, the teacher is not expected singlehanded to attend to four classes.

Our second line of advance has been the conversion of primary into lower middle schools. L. Sohan Lal's graphs show that the number of primary schools and of the pupils enrolled in these schools has been almost stationary within the last four years. This, again, is satisfactory in that it indicates that our largely increased enrolment has not been effected in primary schools, but rather in the primary departments of secondary schools. If it is axiomatic (as I think it is) that a pupil has far more chance of success in a secondary than in a primary school, then it is gratifying to learn that within the last five years the number of middle schools has increased from 615 to 1,810, and that during the last two years alone 810 primary schools have been converted into lower middle schools. We are fast reaching the time when the four-class primary school will be a relic of the past, and when we shall depend on middle schools with eight classes and on primary schools with six classes, and with branch schools to fill in the gaps. My advice to you then is : " Reduce the number of one-teacher schools ; start branch schools but do not let them develop into the old type of one-teacher school ; increase the proportion of lower middle schools ; and by this means effect a more uniform distribution of pupils between the first six classes. "

Still, I agree with Mr. Mayhew that the real line of advance lies in compulsion, and it is therefore pleasing to hear from our

friend, the Inspector of Vernacular Education, that there are now 44 municipalities and 709 rural areas under compulsion. But, before we embark on a widespread application of compulsion, we must make up our minds clearly as to our object. Our main object is not, as many appear to think, to increase expenditure and to increase enrolment. So far as the latter is concerned, I have already indicated that we are within easy reach of completing our task of bringing 80 *per cent.* of the boys of school-going age to school. Again, as I shall try to prove and as is shown by Mr. Mayhew's figures, compulsion is a good business proposition by reducing the cost per literate. The real benefit of compulsion is the retention of boys at school for a sufficiently long period of time to ensure a permanent grasp of literacy, and is thus a guarantee that the money devoted to vernacular education is spent in the most effective manner. As such, compulsion is not an ideal for the distant future, but a present and a practical reality. It is not unreasonable, surely, to insist that if a parent sends a boy to school, he should be expected to give a guarantee that he shall remain there at any rate until the completion of the primary course. If we regard compulsion in this light, then I hope that by this time next year my friend, the Inspector of Vernacular Education, will be able to inform me that the number of areas under compulsion has been more than doubled.

And now I have done, and come to the last solemn final. You, my friends, have showered gifts upon me. You have given me the gift of attention ; you have given me the gift of loyal and efficient co-operation ; you have given me the gift of kindness ; you have given me the gift of comradeship ; and you have given me the gift of friendship. It is my earnest and constant prayer that in the fulness of time, I shall find the gift to use these gifts.

PRESIDENTIAL ADDRESS TO THE ENGLISH SECTION.

BY J. LEITH WILSON, ESQ., M. A.,
Inspector of Schools, Rawalpindi Division.

THE TEACHING OF ENGLISH.

From the programme of this Section which is before you it will be seen that papers are to be read on a large number of the problems which face the teacher of English both in our schools and colleges ; it would, therefore, be out of place for me in the time at my disposal to anticipate the remarks of the gentlemen who are much better qualified than I am to offer both criticism and guidance in the matter of the teaching of English. I shall confine myself, therefore, to glancing briefly at some of the aspects of the teaching of English in our schools and to indicating some of the defects which have come to my notice and to suggesting what may be the remedies for these defects.

You will probably all agree with me that at the school stage we must limit ourselves to providing the boys with a sound working knowledge of English, so that they may be able to express themselves, whether verbally or in writing, in simple yet clear English. This in itself is no mean task, and until it has been achieved it is useless to dream of expecting the boys to be able to read and appreciate the beauties to be found in the masterpieces of English literature. All we can do at this stage is to ensure that while learning the English language the boys will also be brought into contact with the writings, and through them the thought of some of the best English authors, so that their taste for what is best in literature may not be vitiated at this early stage.

Let us suppose, then, that it is the task of English teachers in our schools to apply themselves in such a way that when boys have passed through the 10th class they shall be able to understand the spoken and the written word and to speak and write English so that they can be easily understood. Are our teachers meeting with success? Can our boys write simple correct English? Can they express themselves simply yet fluently in English? Personally I believe that our results are far from what they might be and far from what they ought to be. I also believe that our unsatisfactory results are due to a variety of causes some of which are to be found in the teacher himself and others are to be found in the boys. If you will bear with me I shall attempt to consider briefly some of the weaknesses of our teachers and some of the methods whereby I think these weaknesses might be eradicated.

In our schools we have two kinds of English teachers: The Junior English teacher or the J. A. V. and the Senior English teacher who is either S. A. V. or B. T. The first type, the J. A. V., is again divided into 2 kinds: The F. A. J. A. V. and the Matric. J. A. V. Until 1922 I think almost all those who took the J. A. V. course of training had studied up to the matriculation stage only; but in that year a one year's course of training for F. A.'s was instituted in the Central Training College, in place of the two years' course for matriculates. Since then the centre at Lahore has been closed down and others have been opened in the Government Intermediate Colleges at Multan and Lyallpur. Side by side with these, the two years' course for matriculates has continued at the Islamia College, Lahore, the D. A. V. College, Jullundur, and the Khalsa College, Amritsar. We have, therefore, to-day J. A. V. teachers of two distinct types. Experience has shown, I think, that on the whole the F. A. with his greater knowledge of English makes a better teacher of English than the matriculate. This is important, for the work of the J. A. V. is generally confined to the teaching of English. He, in fact, as a teacher, is the greatest specialist of all, for in very few cases to my knowledge is the J. A. V. called upon to teach any

other subject. The F. A. J. A. V., having proved himself to be a much more capable teacher of English than the matriculate J. A. V., it will, therefore, seem obvious that the expansion of training facilities for F. A's should be carried out and at the same time the courses for matriculates might well be abandoned. The result of such a policy, I am sure, would be an all-round improvement in the teaching of English in the Middle classes.

We now come to the Senior English teachers, the B. T. and the S. A. V. The former is the specialist. He has passed the B. A. degree taking English and two other subjects and for the B. T. degree he continues his career of specialization. His usefulness in the school, therefore, is extremely limited. For though we call him an English teacher, this merely means that he uses English as the medium of instruction. It does not necessarily mean that he is engaged in the teaching of English. He may have to teach mathematics, history, geography, science, or physiology and hygiene. Compared with the B. T., the S. A. V. is a somewhat more useful person. He has also taken three subjects for the B. A. degree but in the Training College he follows a wider course of training than the candidate for the B. T. degree. Let us, however, consider the B. T. or the S. A. V. for the moment purely as a teacher of English. The B. T. is a specialist in that he has confined most of his attention to three subjects; but this does not always mean that he is a specialist in English, although most of his time in school may be spent in the teaching of English. I am aware that there are obvious difficulties which make it impossible to have class teachers in our High schools; yet I think you will agree with me that the class teacher system at the school stage is preferable to the subject teacher. In other words, what is required in a school teacher is a good sound education, neither a smattering of many things nor the specialised knowledge of a professor of one subject together with almost total ignorance of others.

The fact that many of our Senior English teachers confess themselves unable to teach more than one or two subjects to the Middle and High classes is an undoubted weakness in our system. This is due not only to the specialization at the degree stage, but to a much greater fault in our system of education which is visible even in our schools. Let us for a moment turn aside to trace the career of a hypothetical B. T. or S. A. V. from his school days. The history of many would be found to be something as follows:— In the 5th and 6th classes he studies English, a vernacular language, mathematics, history, geography and science. In the 7th class he takes up a classical language in addition to those others and studies it for two years. On entering the 9th class he makes his choice of subjects for the Matriculation examination and for two years he may study English, mathematics, science, drawing or physiology and a classical language or a vernacular. Having passed the Matriculation he looks round for new worlds to

conquer. Some one gives him an idea that it would be a fine thing to be a doctor, so he prepares for the F. Sc. medical examination. This he passes but for reasons into which we need not enter he fails to obtain admission to the Medical College. He, therefore, proceeds to study for the B. A. degree examination. The object here being the attainment of a degree and not always the attainment of knowledge which may prove useful in his future career, he naturally seeks what he considers the easiest path to his goal. English he must take ; Economics he has heard is an easy subject, so is Persian ; so he plumps for these two subjects and in due course becomes a B. A. What does he hope to do then ? "Service" is the most usual answer, or perhaps he imagines that Law holds the key to the future. But he fails to obtain service or he fails in the F. E. L. examination and his thoughts then turn towards the Training College as a last resort, and he enters the S. A. V. class. How is he equipped for his task ? He has studied English, more or less, over a period of 10 years ; but let us not be impertinent and enquire whether he distinguished himself in this subject at any time during that career. The University, wisely perhaps, hides the marks obtained in individual subjects behind an impenetrable veil. He has studied mathematics for 8 years, but he abandoned this subject three years before entering the Training College. Science he also studied for 4 years but abandoned this also at the same time as he abandoned mathematics. It is true no doubt that he has passed his degree in Economics and Persian, but alas ! he is not called upon to teach either of these subjects in any school. So when our graduate enters the Training College he has at his command one subject which he has studied regularly up-to-date which is likely to prove useful to him as a teacher ; but the other subjects ? Whichever he chooses to take up in the Training College he finds, or his teacher finds, that his knowledge requires brushing up ; in fact I believe that there is so much brushing up of this kind to be done in the Training College that there is little time left for the real work of training the students in the proper methods of teaching. It is obvious that even if the teacher proposes to confine his energies to the teaching of English he must have some accurate knowledge of other subjects to which reference will necessarily have to be made from time to time in the English class. In other words, lack of accurate knowledge of simple facts connected with science, physiology, history, and geography must weaken the efficiency of the teacher even as a teacher of English. In view of the somewhat reckless manner in which many of our students flit from one course of study to another it is to me regrettable that only 8 months can be allowed in the Training College for the dual task of brushing up the knowledge of the students and for training them in methods of teaching. But alas ! we in this age of aeroplanes have cast off our sloth and must not be hindered in any way in our hurried progress. Boys must be allowed to waste the most valuable years of their youth when their energies are sufficiently taxed by feeding and developing the body and

the mind—they must be allowed to rush through their school classes in order to enter a college as early as possible. Our students must be allowed to attain the mystic letters B. A., after their names before they have yet reached, what the French call “the age of reason,” and not more than 8 months can be afforded for the wonderful process of being trained as teachers. Not for us the slow leisurely methods whereby a youth acquired knowledge at a pace which did not prevent him from devoting much of his attention to the development of his bodily health, whereby one year or even two years were spent by him as a pupil teacher followed by 3 years in a university and again followed by one or two years in the Training College. Such a system I say we despise as being old-fashioned, slow and wasteful; now-a-days we can afford neither the money nor the time. When a motor-car can be put together and made ready for the road in 5 minutes, why should we linger longer than is necessary over the task for making a teacher? But I believe that in spite of all the advantages of modern methods, many of us look back and are grateful for the fact that we had the advantage of sitting at the feet of one of those old-fashioned class teachers.

If I may be allowed to parody the poet I should characterise our students’ lives as being ‘but a reading and a forgetting.’ There is no one to advise and guide them. Why must our students change their courses of study every two years? The pity of it is that they generally take full advantage of this liberty of choice and expend their energies first on one and then on another group of subjects. I look forward to the day when headmasters and teachers will realise that one of their duties is to guide their pupils in their choice of subject and in their choice of a career. When that day comes and not before, we shall have students entering the Training College, properly equipped for the profession, for they will have carefully prepared themselves to enter it long before they have obtained the magic letters B. A.

One more word before I leave the subject of the teacher’s preliminary training. I wish to say that I believe the system of having Senior and Junior teachers is both wrong in principle and harmful in practice. It is wrong in principle because it implies that the task of teaching the junior classes is less important and requires a smaller equipment of general knowledge than does the teaching of the higher classes. The same harmful principle is found in our primary schools where the infant class, usually the largest and surely the most difficult to teach, is generally entrusted to the care of the teacher with the least experience and knowledge. It is harmful in practice also, for the Senior English teacher with his higher qualifications and higher grade of pay would feel insulted probably, were he called upon to teach the junior classes; and, even if he were willing to perform this task it is seldom practicable, for although the Senior English teacher can perhaps perform the work at present done by the Junior English teacher, the latter cannot successfully do the work of the former.

I realise that there are almost insuperable difficulties in the way of having only one type of teacher in our schools. It would, for example, involve enormous additional expenditure where our vernacular teachers and our A. V. teachers, our drawing master and our drill master to have the same general educational qualification: but possible improvement in the future depends upon realisation of the fact that the present system is unsatisfactory and it is pleasing to note that this fact has been realised at least to a certain extent, in that the Department is endeavouring to create a supply of anglo-vernacular drill masters and drawing masters. But our house will not be in order until the principle underlying the appointment of the anglo-vernacular drill masters and teachers has also been applied to all the teachers in our schools. In that dim and distant future to which we all look forward, when efficiency ceases to be sacrificed on the altar of economy, we shall have in our schools teachers, trained perhaps to teach different subjects, but all having had a similar general education, with the ablest and most experienced in charge of the Junior classes where the foundations of the child's education are to be laid.

I now desire to consider some of the most striking defects which are commonly met with in the teaching of English in our schools:—

(a) Within recent years a departure has been made in our system of education by the institution of Intermediate Colleges. There were many reasons which led to the institution of these colleges but one of these was, I believe, the fact that immediately after the matriculation stage our boys were not sufficiently developed to be able to benefit by the type of teaching which is generally given in our degree colleges, a type of teaching generally called the lecture system. For this reason in our Intermediate Colleges teachers are supposed to adopt the methods rather of a school teacher than of a college professor. While this change is all for the good, it is a regrettable fact that in our schools there is a tendency for the teacher to adopt the methods of a professor and to lecture to the boys. In many schools which I have visited I have been impressed by the fact that many of our teachers talk far too much and the boys talk too little. I find, for example, that Inspectors have frequently had cause to remark that boys show little power of expressing their thoughts orally. This can mean only one thing, *viz.*, that the boys are not given sufficient opportunity to talk in English in the classroom. In some schools the teachers instead of obtaining answers from the boys by judicious questioning, often supplies the answer himself, being obsessed perhaps with the idea that the time at his disposal is short while the number of text-books to be read for the matriculation examination is many. This form of teaching may perhaps enable the teacher to complete his syllabus within the time at his disposal, but as certainly this method will not

help the boys to obtain any command over even the limited vocabulary which they may possess. It is obvious that in order to obtain the answers desired from the boys a number of judiciously selected questions may be required before the point at which the teacher is aiming is reached. If this method is adopted it also follows that lessons will have to be carefully prepared at home and questions to be asked carefully selected beforehand. Herein I think we find another reason why so many of our teachers choose the easier path of talking, explaining and giving answers themselves instead of helping the boys to find the answers for themselves, *viz.*, the latter method entails much more work for the teacher at home. But whereas we can justifiably call the latter method teaching the former resembles more the method of the untrained teachers which has been described thus :

‘ Cram it in, jam it in,
Children’s heads are hollow ;
Ram it in, bang it in,
Still there’s more to follow.’

(b) When teachers have delivered lessons before me I have been struck by the fact that the teacher very seldom has resort to the black-board. I am convinced that whatever may be the reason, many of our teachers use the black-board too seldom. I seldom find, for example, that the black-board is used for the purpose of illustration. In trying to make clear to a class the meaning of a word or a phrase or a passage, teachers are tempted to be satisfied if the boys can repeat the actual words in the text-books or replace certain words in the text by synonyms. On questioning the boys a little, it soon becomes clear that this method is unsatisfactory, for the boys may be able to give synonyms for the words in the text and yet may not understand the meaning of the words used. Where the word, phrase or the sentence under consideration deals with something concrete even a very rough drawing on the black-board makes the matter clear to the boys at once. I may give as an example an instance which came to my notice only a short time ago. A class had difficulty in explaining what a distaff was. This difficulty was overcome very quickly by means of the black-board and a piece of chalk. Similarly also the mysteries of spinning and weaving, a subject which was referred to in the lesson, were easily explained and made clear.

(c) Another defect which I have frequently had occasion to notice, but which I hope is not general throughout the province, is the tendency of English teachers to be satisfied with answers which are either totally incorrect or partially incorrect. Here again the probable reason is that the teacher is in a hurry. When an incorrect answer is received the teacher says “yes” and repeats the answer of the boy but avoiding the mistakes made by the boy. A simple example will make clear what I

mean. A boy answers 'my father is farmer.' The teacher says "yes, my father is a farmer." In such cases it is very doubtful whether the boy realises that his answer was not the same as the sentence spoken by the teacher and so he is likely to make the same mistake in future. Another tendency is for the teacher when he receives a correct answer from one boy to be satisfied with that answer, without making certain that the answer has been heard and understood by other boys in the class. In other words, I would suggest that the teacher should, as a rule, obtain the required answer from more than one boy so that he may be satisfied that the class on the whole has understood both the question and the answer.

(d) *Letter-writing.*—How many of us have suffered from that bulky letter, on which usually postage has to be paid, and which on being opened proves to contain a simple request for a transfer nearer home or for promotion, a request simple enough but requiring two pages of foolscap to be expressed. Not only the children in the schools, but the teachers appear never to have learnt that a sense of proportion is necessary in all things. A memorial to the Government of India regarding the exchange value of the rupees should necessarily be framed in language very different from that in which we announce to a friend our inability to visit him at his home. But from many of the letters which I have to read it is apparent that every subject is treated in the same manner; there is always a rambling prelude which generally commences thus: "With due respect and humble submission I beg to submit." These phrases are constantly used without any regard to their meaning. It is even possible that the writer may not respect the person to whom he is writing and it is almost certain that he has no intention of submitting either humbly or otherwise to the person to whom the epistle is addressed. It is easy for teachers and pupils to learn when to subscribe themselves "yours truly," "yours sincerely," etc., but what is much more important is that they should learn to express their thoughts clearly, concisely and in simple language, with as little verbosity as need be. In the writing of letters florid high sounding phrases should also be avoided. In order to make clear to you how I think a letter should not be written I propose to read to you a specimen which I have long kept with me. As it is possible that the reading of the letter itself may not indicate to you what was in the writer's mind I may explain here that the writer desired to be transferred to another department in which he considered he would have better prospects of advancement in life :—

Sir,—I, the humble petitioner of your Worship, most humbly venture to crave the liberty of your Honour and request the favour of having the following few lines your benign consideration.

2. Owing to your humble petitioner's pitiable state and handicapped circumstances brought about by his present inadequate pay, he had sanguinely approached to you the other day, with an earnest request to kindly give him a lift in life overshadowed by poverty which is graceless, sordid and miserable and in sequence of it you had, he is much thankful to acknowledge, promised him that you would willingly render the necessary moral support in the shape of granting him a line of commendation should a suitable vacancy occur.

3. Under these circumstances he has under deliberate but mature thought and consideration, nay, with a clear but perspective view of the future that awaits him, he has arrived at a conclusion to rejoin another branch of the same Railway to better his future prospects by throwing himself into the Traffic enrolling his name as a First Class Brakesman. Could you not possibly therefore stretch forth your helping hand to lift him up and have him fixed up when there is every possibility, since you are, I understand, a friend of a gentleman, nay, of an administrative officer who carries special influence and respect and is a personal friend of the head of the Department and therefore engages hands on the running staff.

4. In short, a line seasoned with special recommendatory note will not only put him into better position than the present struggling life but much more would put him under deep debt of gratitude thereby.

Can you possibly grant this request--a request of

Your most obedient servant,

* * * *

(e) I suppose that everywhere the direct method is being used in the 5th and 6th classes and that the boys' introduction to English is by means of conversation lessons. I may presume also that the general practice is that the subject matter of these lessons is confined to the things which are more or less familiar to the boys. The difficulty here seems to me to be that the lesson tends to become very quickly stereotyped and uninteresting. The Junior English teacher has so often asked the question, 'what is this?' and received the answer, 'Sir, it is chair,' that he loses all interest in the lesson and perhaps he is not entirely to be blamed. But if the teacher is not interested and fails to hide his lack of interest, the boys will not fail to observe his lack of interest and will become uninterested themselves. It may be hard task but it is still a necessary one for the teacher in the lower middle classes to maintain his interest in the lessons which he gives and by every means possible to make the lesson fresh and interesting to the boys. Here again a little careful thought at home may help the teacher to devise variations in the lesson which will revive both his own interest and that of the boys. It is also desirable that such conversation lessons should be made as natural as possible and should have some relationship to real

life. For example, in teaching the boys English numerals and the plurals of English nouns it is not merely necessary that the boys should understand the question 'how many brothers have you?' but that he should give the correct grammatical answer and an answer which is correct in fact. An amusing instance occurred in a school which I visited and where I was astonished to find that every boy in the 5th class apparently possessed six brothers! Again in another school I found that a teacher in giving an oral lesson on letter writing had led boys of 11 years of age to give as their reason for not being able to attend a friend's marriage ceremony, the fact that his own wife was seriously ill. My curiosity being aroused, I asked one or two of the boys if they had the good fortune to be married and the answer in each case was in the negative. I hope that both these instances which I have given are exceptional; but I fear that all too often the boys are led to believe that much of what they are taught in the classroom is completely divorced from the actual facts of life. The teacher would be well advised to strive by every means in his power to bring his teaching into as close a relationship as possible with the realities of life which are familiar to the boys.

(f) A subject which I fear is liable to recurring spells of neglect is that of handwriting. This is a subject which requires particular attention in the lower middle classes; for if once a boy acquires the habit of careless handwriting it will be found almost impossible to eradicate this habit in the higher classes. The more written work the boy has to do, and the greater the pace set by the teacher in dictation the more likely is the handwriting to deteriorate. Whether copy books are used for this purpose or not seems to make little difference on the whole. The handwriting in the majority of schools which I have seen is far from satisfactory. I do not propose here to enter into any dissertation on how calligraphy should be taught. One thing I desire to emphasise and that is that satisfactory results cannot be achieved unless the teacher realises the importance of the subject and takes great pains with every individual boy in the class. Transcription as it is taught in most of our schools seems to be taught with no object in view whatever. It generally consists in the boys being asked to copy out a passage from their reader and sometimes the teacher puts some marks through words which the boy has wrongly spelt. Were transcription properly done with a view to training the boys in careful neat work and were it properly supervised and corrected it would be found that transcription would improve not only the handwriting of the boys but their spelling and their general habits. All their written work would become more careful, neat, clean and tidy and the boys would be unconsciously learning the habits of careful thinking. One of the great needs in our schools is that the teachers should be methodical in their work and should acquire the habit of thinking methodically. Until that happens it is useless to hope that teachers will be able to implant such habits in the boys.

as any earthly entities with which we are conversant ; that it is not given to us to peruse these changes of generation, destruction and regeneration in our own lifetime, for cosmic changes require incredibly long intervals of time to produce their effect ; that Astronomy is silent as to the beginning and end of things, it not being possible to say which arose first, the nebula or the sun, even as in an humbler sphere it is not possible to say which arose first, the seed or the tree ; that this birth, growth and decay of trees is certain, for even as we can see in a forest all stages of growth from the seedling to the decayed tree that has allowed its head to mingle with the dust, similarly it is possible for us to observe at any one point of time in the heavens, all intermediate stages of growth between the nebula (which may be likened unto the seed) and the dark star which seems doomed to destruction. Are we justified, I repeat, in keeping from our young students the knowledge that when a parent body throws off an off-shoot of matter which together give the relationship of the sun and the planet, the matter of the planet at the stage of being thrown off not being hard owing to its not getting time to cool, but being soft and plastic owing to heat, the force of the parent body raises huge tides in the plastic material of the subsidiary body even as the sun and moon raise tides in the waters of the earth ; that for the revolving planet these tidal waves in the body of the planet excite what is called tidal friction and the planet, while rotating, moves like a wheel under a brake, that this tidal friction produces effects in the planet which are most wonderful and romantic ; that the moon was once born of the earth, and the period which the moon at the time of birth went round the earth was only 4 hours and 54 minutes, *i. e.*, the month was at that time equivalent to about 5 hours of our present time ; that owing to tidal friction the distance of the moon which once grazed the surface of the earth went on increasing till at the present time we see the present distance of the moon ; that owing to tidal friction, the period in which the moon goes round the earth, *i. e.*, the month went on changing till it increased from about 5 hours to about 29 days and then again decreased to about $27\frac{1}{2}$ days in the present age, that the friction of the present watery tides is also lessening the rotation of the earth which means that the period in which the earth goes round, *i. e.*, the day, is lengthening ; that owing to tidal friction, the moon is at present going away farther and farther from us, making a larger round and thus taking longer to complete the round with the result that the month is increasing in duration ; that up to a certain stage the month extended so that the month consisted of 29 days, which was the critical figures in inter-relationship of the moon and the earth ; that after this critical limit was passed (this occurred some time ago, the present number of days in the month being $27\frac{1}{2}$) the day and the month still increased but the day increased more than the month with the result that the number of days in the month began to lessen ; that a day will arrive when the moon will recede at its furthest distance from the earth and at that time the month will contain

only one day, *i.e.*, the month and the day will be equal (this day, however, will be not the present day but will be equal to 55 of our present days, the rotation of the earth owing to tidal friction having slowed down considerably during the passage of ages); that after this, owing to the same cause, the moon will begin to recede towards the earth and continue doing so till it falls back to the earth, unless before actually colliding with the earth it gets shattered into pieces by the force of the earth's attraction; that the action of the same force of tidal friction accounts for the fact that with regard to the number of moons there is a progressing increase as we go outward from the sun, Mercury the planet nearest the sun having no moon at all, Venus having none, likewise the earth having one (the moon was a late birth with the result that compared with other planets the moon of the earth is proportionately of a much larger size relatively to the earth). Mars having two, Jupiter five, etc., (certainty with regard to the number of moons being hard to aim at in the case of the frontier planets of the solar system); that the fate which we predict for the moon of the earth and which supplies us with a very telling illustration of the observation of the poet that the paths of glory lead but to the grave is already on its way to overtaking one of the moons of another planet; that Mars has two moons, Deimos and Phobos, the last named being the inner moon, that Phobos is already in a more evolved condition than our own moon and having finished the preliminary stages, is now approaching Mars, the month for this moon being actually shorter than the day, the moon going through its phases about three times during the day; that Phobos may some day, on account of proximity, get shattered by the force of Martian gravity and thus disappear from the gaze of posterity.

How pathetic man's isolation in nature is! How circumscribed, how cabined, cribbed and confined he is! No other science can take him out of himself as Astronomy can and give him some real glimpse of the infinite.

President Wilson thought fit to indulge in a strong condemnation of science: "Science has bred in us a spirit of experiment and contempt for the past. It made us credulous of quick improvement, hopeful of discovering panaceas, confident of success in every new thing . . . I should fear nothing more than utter destruction conceived and led in the scientific spirit. Science has not changed the laws of social growth or betterment. Science has not made History a whit easier to understand, human nature a whit easier to reform. It has won for us a great liberty in the physical world, a liberty from superstitious fear and from disease, freedom to use nature as a familiar servant; but it has not freed us from ourselves." I have no hesitation in saying that if there is any branch of science that can be expected to free us from ourselves, it is Astronomy.

accepting the inevitable and perhaps curtailing his full cleansing instincts. If he is an ideal citizen he will not merely sneer at his Municipality or swear at it, but question himself as to the part he is playing as a citizen in bringing his representatives to book. It is quite true that under the representative system one elector among ten thousand has only one thousandth part of the power and responsibility of the electorate. But the point in civic life is that if the ten thousand or any considerable portion of them realise a defect and are determined to cure it, nothing will stop them from effecting their object. There may be inefficiency, there may be corruption; there may be personal or other questionable motives which sway a certain number of people; but if the civic spirit animates the majority of the ten thousand, it must triumph over any sectional or individual motives. The universal must always win against the separatist and anti-social instincts.

Our citizen after his ablutions dresses and goes out for a walk. He meets nightsoil carts, offensive to his nostrils. Again he thinks, if he is an ideal citizen, that this is not an offence for which he is free from responsibility. He must know that the sanitation of the whole town is being undertaken by collective effort for the good of all. If the executive carry out their duty inefficiently or in a manner offensive to the sensibilities of the citizens, the citizens must collectively take the matter into their hands and apply the remedy.

Our citizen returns, has his breakfast, and goes out to his work. In the ideal city of our dreams we should live near our work. But that is a condition realised in hardly any actual city at the present day, in an era of large-scale production. If he finds his transport facilities meagre or wasteful, he is again up against the question of civic inefficiency. If he takes a hired tonga or carriage, he knows at once from the number affixed to the conveyance, that it is regulated by the Municipality. If it is badly furnished, if the animal has sores or is used cruelly, or if the driver is wanting in civility, his true civic conscience should prick him and ask the question: "What have *you* done to set these things right"? In very large towns there may be trams or motor-buses or local railways. If there is any congestion of traffic or any defects in its handling, we again come to the question of civic duties and responsibilities. If the roads are bumpy or not well kept or not clean, the municipality, its executive, its councillors, and ultimately its electors all share the responsibility.

On returning home in the afternoon, he finds perhaps a parcel arrived for him by rail, on which some octroi duty had to be paid, or perhaps a bill for local taxation. This brings him face to face with the question of taxation. Is the octroi properly administered, or is it killing or cramping trade? Is it merely a form of taxation on the transit of goods, and thus injurious to the larger interests of the country? Is the direct taxation,

when it exists, properly and equitably assessed and is it used economically for the purposes for which it is imposed? Is it in proper proportion in the scheme of taxation? Is the tax-payer's convenience consulted in every way, and are the services for which it is levied rendered better than they could be done by private agency? When the night comes and he lights his electric lamps or puts on his electric fans, the question arises whether the electric supply is municipal or in the hands of a private corporation with a monopoly, and in either case whether the current is produced and used as economically and efficiently as it ought to be. In some cases the supply corporations have powers incommensurate with the responsibilities which they fulfil. Do they consider themselves the servants of the public whom they serve, or in some way as their irresponsible masters?

If there are children in the family, perhaps there are municipal schools which they attend. Is the education they receive satisfactory with regard to local needs and with regard to the higher purposes of education, namely, to make the children better men and women and better citizens than they would have been without education? Are the schools situated conveniently for all the different centres of population? Do all citizens receive equal treatment in them, or is there a clique or a minority or a majority that puts obstacles in various forms in the way of the unprivileged classes? How is the health of the children looked after? Are arrangements for vaccination satisfactory? Is medical relief easily available and within the means of the people? Are the hospitals merely an exotic preserve for a privileged few, or are they in touch with the large mass of the population, and does this mass support and use them? In particular is maternity welfare and the care of motherhood looked upon as a sacred duty of the community, to be discharged punctiliously, and what tact is employed to meet ignorance and social prejudice, and what resources of statesmanship are mobilised to overcome economic obstacles?

The more indirect health services of civic life are concerned with the prevention of disease and the nurture of a strong, healthy and cheerful race of men and women. The municipal market arrangements, if they are good, will conduce largely to the distribution of pure and wholesome food at reasonable rates. The inspection of foods and drinks dangerous to health will prevent the exercise of the selfish trade of unprincipled profiteers. In all advanced municipal areas in the West the milk supply is an object of constant public attention. Wholesome food well-cooked, well-served, and available at reasonable rates to all classes of the population is one of the main foundations on which the health service of a city rests.

When our citizen goes to sleep at night, the question of watch and ward arises, even if he does not know it. In a well-managed

city no private citizen need bother about his own private arrangements for *chaukidari*. Are the police arrangements good not only for detecting crime but for preventing crime, and for keeping the city free from the evil characters who contaminate the amenities of civil life? Do the citizens look upon the police as their friends, or is there a constant tug-of-war between the private citizen and those who should be the guardians of his peace and rest?

The question of housing has not been taken up by Indian municipalities in the same spirit and to the same extent as it has been in Western countries. But every municipality has some building laws, usually totally inadequate, and not properly enforced. The provision of good dwellings, well-lighted, well-ventilated, and well-planned with regard to accommodation is one of the duties of civic authority. The planning of buildings outside, with reference to the streets, and collectively with reference to the lie of the land and its natural features is an even more obvious duty. But when dwelling-houses are built in that satisfactory way, that does not exhaust the whole requirements of town planning. We require parks or gardens to act as lungs for the city. These should be situated so as to give access to every class of citizen, rich or poor—particularly the poor, because they have less space in their dwellings. These open spaces require to be planned and kept up for the triple purpose of recreation, enjoyment, and the satisfaction of a civic sense of beauty. This brings us to the higher regions of civic responsibility, which are rarely touched in modern India. For the full development of civic life, it is necessary to have good municipal museums, art galleries, concert rooms, music saloons, and other centres for the cultivation of the fine arts. Perhaps these are still far from the horizon of civic life in India. But at least the public buildings we have could be made more beautiful and more representative of the civic life of the people as a whole. Our town halls are usually very disappointing in architecture, very badly placed as regards situation, and very little used for purposes other than as municipal offices. The rooms are often ill-ventilated, dirty, badly lighted, draughty, ugly, and with bad acoustic properties; it is an irony of fate that such surroundings should be used for lectures on health, cleanliness, ventilation, and the comforts and convenience of life. In some Western cities there are what are called Mayor's Parlours, where a certain amount of entertainment and social intercourse take place bringing the citizens into touch with the City Fathers. In social meetings and social life generally, we are many centuries behind the advanced nations of the world. Social life is as it were the entrance hall to civic life. Social virtues have the same position in the intercourse of individuals as civic virtues have in the contact between citizens and civic institutions. Social virtues lead to the civic virtues. It is social amenities that will put the coping stone to civic life and bring home to the citizens their own part in the development

of civic institutions. By their cultivation the Civic Fathers will regain as of old the dignity of true Elders of the City and realise with pride that the citizens are in a civic sense their own sons and daughters.

I have spoken at some length on various aspects of civic life as seen in a city, because the city is the original cradle of civic institutions. Twenty-three centuries ago the only states in which the civic spirit was cultivated and found a congenial home were city states. The words *Civic*, *Civilisation* and *Civil* all refer in their origin to these old city states, in which all the citizens met together in the market-place or other open space in order to elect their executive officers, to enact their laws, to pass judgments in cases of breach of public laws, and to perform civic rites and ceremonies. The cities in those days were located in compact areas, with homogeneous populations (as far as the freemen were concerned), and with economic standards not divided by a wide gulf as between the highest and the lowest. That time has passed away. There are scarcely more than one or two city states in the whole modern world. The majority of states comprise wide areas of territory, with populations in some cases of different races, religions, and social standards, and speaking different languages. The cities form only scattered units in modern territorial states. Even the cities have in many cases grown to such an enormous size that different groups of individual citizens often have no opportunities of personal contact with other citizens living in the same city. Some of the towns or cities (especially in India) are mere amorphous jumbles with very little organised life except in artificial and official forms. In the case of big modern cities it is obviously impossible for all the citizens to meet together and transact their collective business as members of a club do when they meet together in a general meeting. It was to meet this difficulty that representative government and representative institutions were organised. With such institutions our acquaintance in India, both in theory and practice, is of very recent date. It is all the more necessary therefore that we should study their origin, their working in other countries, their suitability to our conditions, and such adaptations as are necessary in order that we may derive the fullest benefit from them and fulfil through them the essential objects of civic life and civic institutions.

The smaller the unit of experiment the better can we see the working of the civic spirit. We can examine it in the working of a small club or society. Coming to territorial units we can study it in the working of a village or a town or a city with a municipal constitution. Our civic pride will in such cases centre round objects which we can see every day, and can be stimulated by public ambitions in which every citizen can claim some part. But our civic horizon will not be bounded by our village and town. In India the next higher grade of government might be the district, although district boards and district administration have

not attracted the same attention in public discussions as the stages of representative institutions above and below them. The province is the next higher grade of civic institutions. Our provinces are tending to be more and more like the States in a Federal Union. When we speak of Government we usually think of the Provincial Government. Our smallest legislative bodies, apart from municipal bodies, are the Legislative Councils of the Provinces. They claim the largest part of the attention of our political workers. While I agree that their development is of the highest importance in the political growth of India, I should like to utter a word of warning as regards the danger lurking in Provincial development. It is quite possible (and I see an increasing number of signs every day) that we may begin to think so much in terms of provincial patriotism that we may forget the claims of India as a whole. However vast our country may be in extent and resources, Nature has given it a unity which we ought to utilise in the realisation of our national instincts. We ought to understand that every citizen has many different grades of loyalty. He ought to be able to reconcile these different grades as far as possible and make them subserve one great and common purpose. I do not blame a Punjabi or a Bengali for thinking of the Punjab or Bengal as the best province in India, but I do think that both of them (and similarly the men of all provinces) ought to rise above mere provincial patriotism and try to understand the needs of the country as a whole if we are to realise civic ideals on a national basis. If we fail to do so we shall probably have a tendency to split up into a number of separate states, which will be in conflict as soon as the artificial restraints now imposed from without are relaxed or removed.

Speaking of the different grades and shades of loyalty, I should like to say a few words on another aspect of the question. In all highly organised societies we are members of different groups for different purposes. The groups may be religious, industrial, social, artistic, or based upon hundreds of other divisions which will readily occur to you if you examine your numerous interests in life. It so happens, from a variety of historical causes, that the religious groups have obtained the greatest prominence in our eyes. In particular what is called communalism takes the shape of religious antagonisms which are absolutely opposed to the spirit of harmony and mutual co-operation which are essential to the growth of civic life. Every citizen has the right to hold what religious views appeal to him most, and true religion is concerned with the evolution of the best and highest that is in man. But it is not permissible to drag any differences in those views into the service of fierce disputes or collective passions and furies which it is the first duty of the civic spirit to curb and regulate. These untoward results are only possible, because we fail to give distinct recognition to our distinct and parallel grades of loyalty. If a man guides his conduct aright he need never be at a loss how to reconcile his different loyalties.

He ought to be true to all, and it should be his pride to discover the means by which he can reconcile any apparent conflict in his loyalties. The civic spirit will help him.

I have already referred to the sense of an All-India citizenship. The executive instrument of that citizenship is the Government of India, with its bi-cameral Legislature, consisting of the Legislative Assembly and the Council of State. In the world at large our civic status is determined not by our province but by our citizenship of India. We ought therefore to send more and more of our best men—those gifted with the larger and wider vision—to participate in the hammering out of the institutions that will fitly claim in the fulness of time the title of National institutions. While doing so, however, we must not forget the large number of autonomous Indian States, which in spite of the backwardness of many of them, still offer the most promising field for the development of our institutions on our own lines, and claim and deserve to the fullest extent our understanding sympathy.

Above the Government of India we have an Imperial tie, which is symbolised by the British flag, the flag of the British Empire. The flag is a symbol. It is even possible for us to have a distinctive national flag and yet to recognise and cherish the Imperial tie. On account of certain difficulties and disabilities which we suffer in certain autonomous Dominions within the Empire, we are sometimes apt to think with impatience or speak without knowledge of the great Imperial tie. If we understand international movements aright and the part which the British Empire as a whole plays in world movements, we shall probably realise how much we should lose without that tie, and how justifiable and indeed necessary it is for us at your present state of development to uphold and strengthen it. We should frankly give it a place in our civic scheme and strive to make this higher loyalty accord with all the other loyalties of which I have spoken. If you strain at the leash, the fault may possibly be yours. The leash is elastic. I know of no character more adaptable than the British character, and no institutions more responsive to local needs than British institutions. It is for you first to understand them and then to adapt them to your needs in the common bonds of empire.

I should not like to leave this subject without speaking of the further development of our human solidarity in the League of Nations and in the various international activities connected with it. The time has gone by when people considered the League idea to be merely an experiment. It may or may not prevent future wars. It may or may not be able to carry out the dream of a federated humanity. But it has given the lead to international action in various matters in which all States are interested, and it has materially helped in bringing out that spirit of international co-operation which must lead more and more to the harmony of nations.

Having given instances of the lines in which the civic spirit works, I will not attempt some generalisation. I will note the three essential ingredients without which its existence is impossible.

We must first have a collective will. That means that in matters of common interest a large number of people wish for the collective good and are willing to sacrifice their personal ends or their sectional interests in order to win the good of the whole. Do not underrate this instinct. In finer natures it is even stronger than the instinct for self-preservation. It is a continuation of the maternal, or parental, or conjugal, or social instinct. The more basic instincts lead up to this refinement quite naturally. Indeed it is a corollary to the instinct of self-development or self-realisation. The individual only sacrifices a baser and grosser form of selfishness in living for the family ; in reality his own life is rendered fuller and more beautiful, and his self-expression finds better scope. So also is the scope for self-realisation extended in the practice of the social virtues in a group morality. And a still higher step taken is with the evolution of the collective will in a State.

This collective will is the first essential of the true civic spirit. But sometimes people allow their collective standards to fall below the ethical level of what they would consider right in individual conduct. To prevent this we must cultivate the growth of a collective conscience. We must see that the view that states are above morality is wrong. History is the finest teacher of this doctrine. It may be that for a time a state that is strong and powerful may be able to trample upon the rights of its subjects or of other states with impunity. But in the long run this cannot last. Does not recent history show this in a striking manner ? What was the Great War but a colossal tragedy based upon the false doctrine that a state can do no wrong ? It was a four years' orgy of ghastly slaughter on a vast scale, and yet some of the finest virtues ever seen in human life were exhibited in the period. What was it that nullified these virtues ? A state may fall from arrogance just like an individual ; only, with consequences displayed on a much vaster canvas. I am reminded of a very powerful allegory from our Muslim theology. The finest creature of God among His angels was Iblis. Dowered with every gift, armed with every power, he was hurled to destruction by his own arrogance and unbelief. In the same way, a State may be powerful and well-organised, but if it transgresses the bounds of good morals by overweening self-confidence or an arrogant contempt of others, the avenging Furies must seize hold of it and bring it to its senses. On the other hand a state which bases its conduct on an understanding of human psychology must win. Within the state the same principles must apply. The laws of good conduct and good manners are as potent in civics as in ethics and good conduct and

good manners never appear so fair and captivating as when they are embodied in the civic virtues.

The third ingredient after we have got a collective will and a collective conscience, is the co-operative instinct in action. This is the practical part of civics. We all have the co-operative instinct in us in some form or another. But it is frequently stifled by personal or sectional jealousies. The true civic spirit redeems us from these jealousies and enables us to carry into action the collective will and the collective conscience ; so that we feel a pride and responsibility not only in our individual actions but also in our civic doings and our civic history. This is all the more possible, now that nearly all states have enfranchised the women, and a new spirit of social service and a new opening for social opportunities have been opened out to men and women in most of the advanced States. The rights of the children have also been recognised not only in the family but in the state. We can look upon children as themselves guardians of the new civic spirit which will thus embrace every member of the citizen body.

This is why civics is so important even in the earlier stages of education. As I said before, civics is not merely a department of intellectual knowledge. You want a spirit and an atmosphere for the cultivation of civics. Such a spirit and such an atmosphere can be created in school life itself. From the earliest stages of school life children may be trained to realise that their discipline is not a matter of an external or arbitrary will. It is but the embodiment of their own standard of collective right conduct. They can group themselves into classes or sections or game groups. But above and beyond, all their activities should tend to the good name of the school. The honour and glory of the school should be their cherished ambition. The school will thus become a mirror of the state, and it will not be merely a haphazard or an arbitrary state. It will be a state that will realise our highest dreams of freedom, right conduct, collective responsibility, and collective pride.

PRESIDENTIAL ADDRESS TO THE CLASSICAL LANGUAGES SECTION.

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THE IMPORTANCE OF CLASSICAL LANGUAGES.

Probably each Section in turn is represented by its President as the most important in the whole Conference. My reasons for insisting on the importance of this Section, that of the classical languages, are based not only on the inherent interests of the

subject but also on the fact that for the teaching of no other subject has less been done towards solving the difficulties involved, that no other part of the teaching in the schools and colleges is in greater need of reform.

That the classical languages are generally regarded as important is indicated by the regulations which make one of them compulsory in the Arts Faculty up to the Intermediate stage. In other respects, including the financial one, one might suppose that they were considered to possess no real importance at all.

Why has a classical language been made compulsory? Of course there are people who say it ought not to be so. Some people would like to substitute a modern Indian language. I think they are wrong. No modern vernacular can properly take the place of a classical language until it has itself become Classical.

The meaning of that dictum I hope to make clearer a little later, but for the moment I want to put to you the question, Why was it thought necessary to make a classical language compulsory?

Two explanations may suggest themselves:

(a) Latin and Greek have been compulsory in Europe. When Western education was introduced into India, it would have been absurd to make Latin and Greek compulsory, but it was felt there should be something equivalent to take their place. The Oriental classical languages were put into the scheme as substitutes for Latin and Greek.

This, however, is not a good reason unless we can justify the making of Latin and Greek compulsory, and show that the principles involved in that practice apply also to the Punjab.

(b) It may be said that every student should know the language of his Scriptures. But if this were all, really good translations might solve the problems. In fact how many Hindus know Sanskrit? How many Christians know Hebrew, Aramaic or Greek? How many Muslims can read Arabic? Persian is not the original language of any sacred Scriptures, nor is Latin. Yet both the suggested explanations contain something of the truth.

Greek and Latin have been the languages of two distinct phases of civilization in Europe, on which modern European civilization is based. There have been other influences and notably the Hebraic influence of the Bible and also much Oriental influence previous to the Renaissance and the Revival of Learning, but the fundamental formative literatures have been Greek and Latin.

I will try to give you a very brief sketch of the history of those languages.

Greek is the language of Aryan invaders who occupied the sites of an older civilization in the islands of the Ægean Sea and the mainland on either side. From the fusion of the newcomers with the ancient inhabitants, whose picture writing we are unable to read, there arose a people who developed a wonderful art, and a wonderful literature. The earliest work of that literature, the poems of Homer, seem to have been developed on the coasts of Asia Minor nearly 3,000 years ago. These great epics—the Iliad and the Odyssey—were not completed, once for all, by a single poet but were recited for generations by groups of wandering bards passing from the house of one rich man to another, singing of the glorious deeds of his ancestors. Each generation added something or changed the arrangement and even the dialect until at a later time a definite version was fixed.

To the time of the great struggle with Persia, when the Greeks won their independence from Asia, belongs the outburst of drama and poetry that is associated with the name of Athens. In Greek, the language of an inquisitive restless people singularly free from the trammels of superstition we find the beginnings of European philosophy. Greek philosophy culminated in Plato and Aristotle and it was many centuries before any further advance was made.

When the Roman Empire embraced the whole basin of the Mediterranean, Greek remained the official language of the Eastern half of the Empire. In Asia Minor and Egypt a Roman official like Cicero had to do his work in Greek. The New Testament was written in Greek.

When the Empire split in two and Byzantium became the capital of the Eastern Empire, its language was Greek and the attempt to introduce Latin as being the language of Roman law failed miserably. Byzantium or Constantinople was still speaking Greek when it was captured by the Turks.

The language of the modern Greek newspaper does not differ greatly in its structure and in much of its vocabulary from the Attic dialect of the days of Pericles or the language of the New Testament. Yet although the language has been kept in use in a form so little changed, no really important work has been written in Greek for quite 1,500 years. The Greeks handed over the torch of literature to the Latins, to whom they taught the arts of poetry and rhetoric, while they themselves sank into the trivialities of a hair-spitting theology.

The history of Latin was very different. This was originally the rustic speech of Latium, a small district south of the Tiber. On a cluster of lower hills on the left bank of the Tiber there was a small group of villages, placed it would seem to watch the movements of the Etruscans across the river. These Etruscans were a mysterious people, speaking a strange language utterly

different from that of the Latins. It seems certain that they had come from Asia. In any case their material civilization was much more developed than that of the Latin shepherds and cultivators. In the course of time the Etruscans crossed the Tiber and laid out a city on the hills of Rome, itself an Etruscan name. This new city became a great trading centre between the Etruscan cities of the north and the Greek cities in the south. There was communication with Carthage down the river and by sea.

The Etruscans were the first great engineers of Italy, who drained marshes, cut through forests, made roads and cities. Much that we regard as characteristic of Roman civilization and, as some think, the sterner aspects of the Roman character are due to that ancient people.

Eventually the Etruscan power began to decline. They were defeated by the Greeks in South Italy, and they abandoned Rome.

The New Latin city vastly modified by the Etruscan domination (how much the language was affected we do not know) entered on the long series of wars, in which at one time she was fighting for very existence, at another time expanding her frontiers in a spirit of greed and brutal ferocity. The towns of Latium, the Etruscans, the Greeks, the other Italian tribes, the Celts of North Italy, France and Britain, the Iberians of Spain, Carthage and the Berbers of North Africa were all defeated, and all these victories were followed by Roman occupation, Roman Law, Roman Arts and Latin. This expansion of Latin was checked only by Greek in the East and the German dialects of the wild tribes in the North. Britain and Africa have adopted other languages, but all the rest of that wide area is still speaking languages derived from Latin.

In literature though Rome was a pupil of Athens, she developed an individuality of her own, with a solidity and a restraint in verse and prose that reflect the Roman character at its best. In the last century of the Republic and the first century of the Empire Rome achieved great literature. Latin became the official language of Western Europe, and then the language of Christianity in the West, which it still is in the Roman Church. It became the means of communication between educated men of different countries, it was and continued to be for many centuries the only language of instruction in Western Europe. It is only a few centuries ago that French, English, etc., were able to displace Latin as the medium of instruction in the Universities. Newton's famous treatise is in Latin. Though Latin has been used by learned men up to the present day, there has been no great literature written in this language since the rise of the modern languages.

This short sketch may serve to indicate how much European thought owes to these two languages. Incidentally we have seen that they have both played a great part in the history of Christianity.

Now in connection with the history of Latin and Greek we may ask another question. What do we mean by a classical language? Originally a Classic writer—*Scriptor Classicus*—was an author of the first rank, a first class writer. “The Classics” came to mean the choicest products of the literature of Greece and Rome. The term is now used in a somewhat wider sense. In the developments of literatures we find that a language has a “Golden Age”; a period in which that particular language, the vehicle and expression of a particular phase of civilization, reaches its full perfection. The language itself reaches its highest development and its literature the most perfect form. There may be one or two waves of such high achievement at a short interval, then follows a “Silver Period” with variations in style but nothing very original, and then perhaps a long period of decadence and decay.

A language which has achieved its greatest literature and that in the first rank, great enough to dominate and discipline younger literature—that language is Classical. By this standard Persian is a classical language, as I believe French already is, and English on the verge of becoming one.

We must come to the problems of our own three classical languages. But I would like to remind you that the problem of how the classical languages should be taught in Europe is one that has occupied some of the most brilliant intellects in each generation for just about 400 years since the Revival of Learning. In 1517 Roger Ascham was preaching the value of translation in teaching Latin and protesting against the mistake of trying to talk it too soon. Milton denounces mere verbal knowledge. And in 1903 was founded the Classical Association of which one aim is “*to impress upon public opinion the claim of classical studies to an eminent place in the national scheme of education*”, and another “*to improve the practice of classical teaching by free discussion of its scope and methods.*”

Much of the classical teaching here to-day is no better than the monkish teaching of Latin by rote in the early Middle Ages. We have four centuries of arrears to make up, and the sooner we set about it the better. What is the teacher of a classical language trying to do? What aim has he in view? Perhaps we can frame an answer to this question on four different levels:

1st Level—The lowest, how to get the best possible examination results with the least possible trouble or, how to cram just enough dead language into young Panjabi heads to get them through the Matric. and Intermediate.

2nd Level.—How to make the best use of the inevitable courses in the classical languages for training the intelligence of the pupils. Or, how to use a grammatical system as a mental gymnasium.

3rd Level.—Regarding the classics as not only compulsory, but also valuable, how to encourage intelligent study and to inspire an enthusiasm for the subject which may lead the student to study further, and perhaps even becomes a teacher like ourselves.

4th Level.—The highest, how to make the classical courses a focus for education, moulding the character, training the imagination and judgment; how to inject into young minds something of the wisdom of age by contact with the great thoughts of the ancients; how to interest the modern boy in his ancestry inspiring a deep if chastened patriotism; how to make the Classical training react on modern language without stifling it with a pedantic vocabulary; how to recover what is precious in the old traditions, and transmute it into modern forms; how to contribute towards the solution of the great problems:—What is to be the place of the India that has been, in the India that is coming into being? In particular on the more academic side, how to lay the foundations of sound historians and archaeologists, of philologists and philosophers among whom there may be even statesmen and politicians, of writers in noble prose and verse, of cultured men and women.

These four levels may be assigned to four different types of teacher :

<i>Level</i>	1	.. The Rascal.
„	2	.. The Grammarian.
„	3	.. The Worthy School Master or College Professor.
„	4	.. The Scholar, or Genius.

The lowest level we may ignore. Probably most of our practical suggestions will be on the 2nd or 3rd level, but we shall not get our subject on to a proper footing until the problems of the highest level have been realised and held in view when organising even elementary teaching. Even the start should be planned according to some notion of the goal and object of the journey.

Before committing ourselves however to any rash generalisations it may be well to notice important differences between the three languages with which we are concerned, differences in their structure, in their history and in their relation to India. Sanskrit covers an enormous range in time and possesses a vast literature. It has a synthetic structure, that is, it possesses an inflectional system (like Greek and Latin) whereby a single word conveys the meaning which in English or Hindi would be expressed by several separate words. This grammatical system is complicated and not very easy to learn. The language has developed a love of very long compounds, so that a single compound word may require several sentences in English or Hindi for its translation. The end of one word is altered according to the beginning of the

next word, and often combined with it in such a way that the beginner is baffled in his attempt to see where one word ends and another begins. The literary language is far removed from the natural flow of conversation. The initial difficulties are perhaps greater than in any other language.

Historically, Sanskrit, (including the Vedic language) begins in the period of Rig Veda, 1500—x B. C., a point where the structure of the language approximates to that of Indo-European, the language which we have to postulate in order to explain the resemblances among that great family of languages that extends from Iceland to Ceylon. English, German, Russian, Greek, Latin, Persian, etc., are not derived from Sanskrit but from the same source as Sanskrit. Later on, in what is called classical Sanskrit, the grammar is somewhat amplified, but not perhaps made easier, and the vocabulary is enriched, partly by forming new derivatives, partly no doubt by absorbing material from outside. This type of language was no longer the speech of the people in the time of Gautama the Budha, and in the 3rd century B. C. the Emperor Asoka's inscriptions do not give us a single sentence of Sanskrit.

The earliest scriptures of the Buddhists and the Jains are recorded in Pali and Ardha-Magadhi, two languages, independent of Sanskrit, but closely allied. A later form of Buddhism in India, that of the Great Vehicle, adopted Sanskrit as its language of exposition. In the days of King Kanishka (an early century A. D.) the great scholar Ashvagosha wrote plays and a metrical life of Buddha not only in Sanskrit but in a developed literary style. Rudradaman ruling in the West of India in the second century has left us an inscription in pure Sanskrit. The Gupta period was the golden period of Sanskrit literature (we may include the reign of Harsha). To this period and the centuries immediately preceding must be assigned a vast mass of Sanskrit composition, Epics, Puranas, Law Books, etc., and to this golden period belong a number of the greatest names in Sanskrit literature.

The stream of Sanskrit writing continues even when the kingdoms of the North are captured by Muslims from the West. To the fourteenth century belongs the standard commentary on the Rig-Veda. That was a time of great literary activity in South India. Up to the 14th century at least the history of Sanskrit is a reflection of the history of India, though of course the picture is not complete in all details.

Sanskrit is still the connecting link with India's ancient civilization, which still permeates the very fibres of Indian life. Persian is a younger cousin of Sanskrit. It is descended from Old Persian, the language of Darius the Great, which was a sister to the Avestan used by Zoroaster, and mother to the Middle Persian of the Sassanids.

Modern Persian dates from about 1000 A. D., finding its first literary expression in Firdausi. This literature was born in a nationalist reaction against the universal use of Arabic for literary purposes in Persia. Persian became the language of courts and refined life in Iran, in Central Asia and in North India. Persia has often been a hot-bed of heresy, that is, of original thought. Persian has often been the vehicle of daring Philosophy, and still is. In India Persian has been the vehicle of a different civilization and a different attitude to life. It has been the chief medium for a knowledge of Islam, not merely of the orthodox system but also of unorthodox views, themselves influenced no doubt by contact with Indian philosophy on one side and with Greek philosophy on the other.

It is interesting to note the results of the clash of this new language from Iran with Sanskritic India. There is a process of fusion represented by poets like Kabir, there is a new movement in religion and also a return of interest in the oldest texts. All this reminds us of more recent movements of thought that followed the impact of a more recent civilization and language from the West of Europe. Persian as we teach it is comparatively modern. The more ancient forms of Persian (and Avestan) are not taught in our schools and colleges. The grammar is simple and can be learned more easily than Sanskrit by conversational methods. Though an ornate literary style has been developed the structure of the language used is not far removed from that of daily life. Large blocks of the vocabulary are already familiar to speakers of Urdu.

When the Punjab University was founded there was long debate on the question whether Persian was a classical or a modern language. I have already suggested to you that like French, and perhaps English, it is both. In any case a knowledge of Persian is essential to the understanding of the history and development of India from about the 13th century. An obviously important element in Urdu, it has contributed a great deal to other Indian languages also. It is a language still spoken on our borders, for it is used by a cultivated people in Afghanistan, whence its use extends far into Central Asia : it is the national language of a country, which has a long history and which may have a great future.

Arabic is another inflectional synthetic language but of a very different type. Its three-letter roots and the predominance of the verb over the noun are well-known features of the Semitic family, which includes the Hebrew and Aramaic of the Old Testament and Assyrian, the language of Mesopotamia, which superseded Sumerian.

Arabic is the expression of a mentality very different from that of a Persian poet singing in a garden with the nightingale, the wine cup and all the figures of a mystic philosophy and still

further removed from the life of an Indian palace or forest hermitage. The Arabs, and perhaps all the original Semites, before their blood was mixed with other races in captured cities were sons of the desert, bred amid hot winds and sand, vast silences and endless strings of camels, showing in love and hate a vigour and directness that seem devastating to those that are used to the delicate nuances of softer conditions.

All this is stamped on the language. But this poetic dialect of Bedouin tribes, rhythmic with the foot-pad of the camel with the metallic ring of a new sword, burning with passion, terrific in satire and abuse, became the vehicle of a new faith, a religious impulse which spread to Spain in the West, to the borders of China and to Java in the East.

In contact with the ancient, but decadent civilization of the Mediterranean, Arabic absorbed the learning of the Greeks and even transmitted it to the West of Europe. In the 13th century the Latin speaking Universities, Oxford, Paris and the rest had much to learn and did learn much from the Arabic Universities in Spain and elsewhere.

Arabic is the key language to the study of Islam, and of the greater part of Islamic history. It has become an essential element of Persian and thereby of Urdu.

The great problem of Modern India is to blend these ancient streams of culture with the recent flood of science, economics, politics and industrialism from the West, not forgetting the very real contribution of English letters. All these elements need to be merged into a new culture. No solution of the problem which omits the modern world is likely to be successful, nor can the old world be ignored.

In civilization it is impossible to make an absolutely new start like a shell shock patient who has lost his memory. The other day I read a French story of a French officer, a journalist, who was picked up insensible by the Germans and owing to certain accidents was believed to be a German. When he regained consciousness, he had completely lost his memory. He had to be taught to speak, read and write, all of course in German. He spoke and wrote it very well, and yet he seemed somehow different from other Germans. There seemed to be something strange lying at the back of his mind, his writing, for in the course of years he had become a writer, seemed to echo the ideas and even the expression of another people. The story attempts to describe the way in which the man's friend, who had discovered him, gradually awoke the numbed memories by means of suggested association and restored him to his own individuality. It occurred to me that this story might serve to illustrate my meaning.

If India absorbs all that modern science has to offer, learning it in a Western language, she may do all this extremely well, and yet if the old memories are paralysed, there will be something missing, something lying sub-conscious clamouring for expression without which India cannot realize in full her own individuality.

The old memories and intimate associations find their noblest expressions in the classics. Our problem is how to blend the old and the new, not how much can be stored in contiguous but water-tight compartments. One may be up-to-date without being cut adrift from the traditions which lie at the back of modern life. Can we not cultivate an appreciation of ancient lore without losing contact with the present world ?

If such be the general and fundamental problems involved in the organisation and teaching of classical courses, what practical suggestions, you may ask, can be made to forward the end in view.

The papers contributed to this Section will deal with particular aspects of the subject. I shall confine myself to one or two general recommendations relating to students and teachers.

The students must be taught to work and read for themselves, not merely sit and listen while the teacher explains all the difficulties and gives them a translation to cram. Each student must have his vocabulary or dictionary and be compelled to use it, not to regard his teacher as a living dictionary to be used at will and without extra charge. The student must have his own grammar and be made to refer to it, not merely for learning portions by rote, but to verify forms that occur during a lesson. The teacher should determine how much of the grammar is to be learned by heart, and what is to be constructed by the application of rules. A full comprehension of a complex grammatical system can come only at an advanced stage. In the earlier stages advantage should be taken of the memorising faculty but deliberately and not to the detriment of the reasoning powers.

There should be graduated training in the translation of unprepared passages, and in translation from and into another language.

Incidentally the facts of the language studied should be associated with facts of other subjects, history, philology and daily life.

In the more advanced stages the study of a classical language should be combined with that of its literature, the history and civilisation of the people who created that literature, and the bearing of all this on modern life.

The teachers then must be men of wider knowledge than is generally thought necessary. Not all alike, but some who know several languages, some who are well read in history and archæology, others whose bent lies in the direction of abstract thinking, logicians and philosophers ; others again who have been trained in philology, in every case a scholar and not a fossil.

The teacher must always be learning. The moment he ceases to learn he should be sent away, with or without a pension. He must combine a profound knowledge of his subject, especially part of it, with a good wide general education.

To teach properly in a school or college the graduate needs something of the thorough knowledge of the best type of Pandit and Maulvi, while these latter must have the width of culture which we expect of any educated man in other walks of life.

I am aware that we are on delicate ground. Many scholars think that a modernised Pandit is a Pandit spoiled, that the traditional learning should be kept uncontaminated by modern ideas.

The late Dr. Spooner used to argue that if we could bring an Egyptian mummy to life, that ancient Egyptian could tell us vastly more about the life and thought of ancient Egypt than any modern scholar can hope to do, he could explain many obscurities in the texts to which we have no clue. The real Pandit, he maintained, who continued the traditional learning without being confused by any modern notions, had a similar value, he still belonged to the ancient days and possessed, so to speak, a contemporary's knowledge of ancient texts. Such a revived mummy (if he happened to be learned and intelligent) could, I agree, explain many points that puzzle us. To the advanced student he would be of enormous assistance, but it does not follow that he would be an ideal teacher of youth. I would give him secluded quarters in a museum or a library, but I would not make him a teacher in a school.

Similarly the Pandit and Maulvi of purely traditional learning may find a place in a University to the great benefit of advanced studies, but he is too ancient to be a good teacher of boys and girls. In the long run (in less than four hundred years, I fancy) the Pandit and Maulvi must be modernised or banished from the schools. India cannot go on indefinitely sacrificing so many hours of opportunity at school to the moloch of a decadent conservatism. Mind you, by modernised I do not mean that they must necessarily be trained in the English language, but they must be educated cultivated men in touch with modern thought.

Some efforts are being made to effect improvements. If the importance of the matter were better understood, and the magnitude of the task, these efforts, I am sure, would be multiplied by ten and the necessary funds would be supplied. I hope I have succeeded in justifying my claim as to the importance of this Section, and in conclusion I would wish to repeat those two sentences from the aims of the Classical Association, which seem to be peculiarly appropriate to our problems in India to-day,

"to impress upon public opinion the claim of classical studies to an eminent place in the national scheme of education,"

"to improve the practice of classical teaching by free discussion of its scope and methods."

PRESIDENTIAL ADDRESS TO THE PHYSICAL EDUCATION SECTION.

By H. W. Hogg,

Adviser in Physical Education, Punjab Education Department.

PHYSICAL EDUCATION.

It is a great privilege and honour to me to have been invited to become the president of the Physical Education Section and address the Conference on the subject of Physical Training. I regret that I cannot lay claim to being an educationist; but I sincerely trust that the contribution that I have to make this afternoon, will be of as much importance to the great scheme of education as any other branch touched upon at this Conference.

The subject of Physical Education is a fascinating one and the trouble has been in the past that little or no real attention has been given to it by educationists in India. I know that I shall be challenged on this point, but I wish to make myself clear when I say that little or no real attention has been given, and the results of the present day standard of the physique of the average teacher or student in our normal schools and colleges will bear out that statement.

While listening to Sir George Anderson this morning, I noted that he repeatedly reiterated the statement that he craved the gift of being able to use the many gifts around him, and Mr. Leitch Wilson in his address on the teaching of English also said that in the training of the average teacher at the Central Training College a great deal of the time of the staff was taken up in trying to rectify the evils of previous training before the serious work of the college could be attempted and fulfilled. One has only to walk on to the assembly ground of any college or school in the Province to see just where Physical Education has failed in the past. There is no regard to deportment, walking is a mere slouch through life, and in the concerted movement of marching one has only to attempt the training of a group of students to realise how this important subject has neither been taught nor attempted in the earlier training of the student's life.

I do not wish here to elaborate this point as I will do so later, but I wish to say that I am not satisfied in my own mind that the educational authorities of the Punjab have yet realised the true value of physical education and physical training in the schools. There is still a feeling that any person can take up physical training and any type of man who presents himself is given the job. The term "drill instructor" instead of being a term of respect is usually used to express the fact that the man concerned is looked upon as one of a lower order and of little or no value to the department. I dare say that the type of man recruited for physical training in the past has made this feeling

possible ; illiterate men, many of them, their only qualifications being a sound-looking body ; men with little or no mental attainments have been recruited and trained. I know that this matter has taken up the attention of the physical advisers to the Education Department for some years past, and that a higher and better type of manhood has been looked for, but it has nevertheless been the fact that for the past 10 years in the history of the Punjab Education Department, most of the physical education has been in the hands of men of inferior educational qualifications, with little or no standing in the school to which they were appointed and more often than not treated as one of the menials of the school. I am giving forth no new knowledge when I say that many of the drillmasters of the schools have been used by the Headmasters in practically every capacity but that of a drill instructor. They have cooked for the headmaster, they have done his mali work, they have been bhishties, they have done the chaprassi's work and all their physical training periods have come down to a few odd moments when the boys were available and some teacher had not turned up to do his class work. In saying this, I do not wish to detract from the Vernacular drill instructor who has done good service, nor do I wish to belittle a body of men who through no fault of their own have not been given a chance, but I do wish to bring before this Conference the very great need of a change in the attitude of mind both in that of the inspectors of schools, headmasters and teachers generally, and I wish to say that Physical Education can make no headway in the schools unless those who are at the head of the system back it up and insist upon seeing that only the best men are employed and facilities granted to them for the carrying on of their work.

I am grateful this morning for the services which have been rendered by many of the pioneers of this movement in the Punjab. It is a very real pleasure to me to be associated with Sir George Anderson, Director of Public Instruction, Punjab, and Major R. Sanderson, Inspector of Training Institutions, who both realise the importance of the physical development of the body as well as the development of the mind and to many others of the inspecting staff who by their sympathy and help are now beginning to bring about the desired change. But neither Sir George Anderson nor Major Sanderson nor the Inspectors of Schools can bring about any real change if the headmasters of schools and the ordinary teaching staff do not realise the importance of this work. It has been said that the battle of Waterloo was won on the playing-fields of Eton. I would like to add to that and say that the great things of life have been attained through the teaching of control, not only of mind but of body, in the primary, lower and elementary schools of the world. It is not the college with its highly trained staff and beautiful playing-fields that will produce the greatest results, but the ordinary school properly organized and run which will train and develop the boys of the nation and fit them for playing on those college grounds

that I have mentioned. I would appeal to the headmasters and teachers of the whole educational system and say that if they would look upon physical education as one of the most important subjects taught to their boys; if they will regard it as an integral part of the school life where regular periods are given and where not only the drillmaster but the teacher of the school and the headmaster himself treat the subject sympathetically; if they will identify themselves with the boys, in physical culture, and in development in games; then what we are now to attain will very soon come to pass and the old hackneyed phrase "a sound mind in a sound body" will really become a part of our school life.

Object of Physical Education.

I now come to the second part of my address. What is the object of Physical Education?

The object of Physical Education and Training is to help in the production and maintenance of health in body and mind. The conditions of modern civilisation with its crowded localities, confined spaces, and sedentary occupation; the increasing need for study and mental application; and the many social circumstances and difficulties which restrict opportunities for natural, physical growth, all require that children and young people should receive physical training by well-considered methods devised in a broad and catholic spirit to promote and encourage the health and development of the mind and body. Physical Education includes all activities likely to minister to physical health, not only gymnastics, games, swimming and dancing; but sports, walking tours, school journeys, camps, scouting, and all forms of occupation and exercise likely to create a love of the open air and a healthy way of living. It is especially during the period of growth when body, mind and character are immature and plastic, that the beneficial influence of Physical Training is most marked and enduring. And the highest and best results of education cannot be attained until it is realised that mental culture alone is insufficient and that physical exercise is necessary to the development not only of the body but also of the brain and the character. Physical Training should thus be commenced when the child first attends school, and should be continued at least throughout the whole of the growing period. The natural free movements of the very young child supply all that is required at the beginning of life in the way of physical culture. When, however, the child first comes to school, his natural desire for movement is necessarily restricted for purposes of organization and discipline. The restriction must be compensated by frequent opportunities for free movement, which should chiefly take the form of play. This constitutes the first step in what may be considered as Physical Training. By degrees a few simple exercises may be introduced into the curriculum, which should still contain a large

element of play, but play directed by the teacher. The exercises should then be gradually increased until they take the form of regular lessons on the lines indicated hereafter. It is of the greatest importance that the recreative element should never be omitted if the best results are to be gained. Enjoyment is one of the most necessary factors in nearly everything which concerns the welfare of the body, and if exercise is distasteful and wearisome its physical as well as its mental value is greatly diminished.

I would like to emphasize this matter of the recreative element. We laugh when we hear the phrase "Play-for-all Movement" mentioned, but I would like to point out to you that there are immense possibilities behind the idea of the Play-for-all Movement. The old idea of a trained team based on the gladiatorial system when one or two champions were selected from a school or a college and sent out to do service in the field is not, to my mind, the ideal of physical education and I would like to pay tribute to men like Mr. E. C. Earl and Rai Bahadur Lala Atma Ram, who have sown the seeds of the play-for-all movement in this province and who have shown what can be done by limited equipment and space in making it possible that every boy of a school, no matter what his age might be, can (and indeed he does) enjoy a certain amount of recreation in the simpler form of games that have been introduced.

I am the last person to decry the beneficial results of major games but in many of our elementary and secondary schools the play-ground accommodation is absolutely inadequate for the proper conduct of such games as football, hockey, cricket, etc. That being so, to deny the scholars the right of recreation because they cannot play football, hockey, cricket, etc., would, to my mind, be the height of folly. It is here that the value of the play-for-all movement and Scouting games in particular ought to be emphasized, and far greater results are attained by the mere fact that the boys and girls taught to play and to run and to jump and to move their limbs in a natural way in simple games, than when they sit round a field and watch a team disport themselves.

Exercises which are enjoyed are doubly beneficial and different types and methods of presentation are required for different ages of the children to make them most attractive. I would like again to emphasize this point to the headmasters and the teachers present, that in the play-for-all movement, with its wide range of activities and its possibilities for real organization and supervised play, there lies the possibility of play life in education, physical, social and moral, and the means of bringing out a better understanding of what real physical education means. Again, let me say that I do not wish to decry the major games or to belittle their value. I know that the tradition and the possibilities of hockey, football and cricket for developing team work and fair play are invaluable, and no school should be without a

first class hockey, football or cricket eleven, but we must not stop here and in the minor games, which are shown at every Scout rally, we have a wider range which can take in the non-athlete, the boy who is backward and shy, the boy who could never shine as a forward in football or hockey, the boy who has not the strength to play vigorously for the time demanded by a major game but who can enjoy in his quiet way the type of humbler game which helps him to express himself, as nothing else could.

Kind of Physical Education and Training best suited for Schools.

Now let me turn for a few minutes to the kind of physical education and training best suited for schools. I know there is a great deal of difference of thought about this matter and on one side we have those who decry the value of calisthenics and ordinary arm exercises as being too mechanical and of no use to schools. There are others who demand that calisthenics and only calisthenics should be taught, that the swinging of Indian clubs by boys for long periods every day should be made compulsory; that dumb-bells and wands should also be a part of every school equipment and that all this play-for-all movement is defeating the object set out by the orthodox physical trainer. There is a saying that when thieves fall out honest men get their due, and I might parody that by saying that when so-called experts fall out, then the humbler men have a chance of showing what they can do. I do not wish to tread on ground that will lead to controversy but we have to be perfectly clear in our own minds as to the kind of physical education and training which will be best suited for boys who are young; and here again I would remark that everything depends upon the leader and teacher of physical education and training. We are at present carrying on a system of training with a special Physical Training Class in the Central Training College where we are emphasizing 3 points: (1) the necessity for strict discipline in all movements; (2) the necessity for a large amount of real recreation; and (3) the necessity for building up systematically the physical health of the boy. Let me for a moment dwell on the first point, namely, the insistence upon discipline. One has only to walk through any of our schools to see what an utter lack of discipline there is in the every-day habit and deportment of both teachers and boys. I have tried repeatedly to get men in the S. A. V. and B. T. classes of the Central Training College to stand still for 30 seconds. If you want to see how difficult it is, try it for yourself; the twitching of fingers, the movement of the head, the adjustment of dress, the scratching of one's self that goes on is amazing, especially when you have asked them in plain language to stand still. Try it on your own play-grounds, try it in your schools and you will see just where my remarks apply. I maintain that physical training carefully controlled will, once and for all, settle the question of obedience and discipline in

controlling one's class. In marching, for instance, on the command 'halt,' how many can halt and stand still? In standing in a line, how many can keep the position of attention which is necessarily one of control? During major games, such as football and hockey, how often has the referee to remonstrate with players who have lost control of themselves and who are not under discipline either from their captain or from the referee himself? Discipline is one of the fundamentals of physical training, for without it no physical instructor can obtain results, and here I would suggest to the headmasters of schools that if they could institute 10 minutes' play-ground drill as the school assembles where they themselves would be present, and where they would insist upon every boy standing in line according to his class under the command of his own teacher, and the simple movements of attention, stand at ease, right turn, about turn, were gone through, he would see at the end of one month results which would surprise him in their extent. But I can hear some of my critics say I am bringing in military discipline and military drill which are not a feature of Physical Training. I would counter that by saying that discipline is one of the first essentials of Physical Training and the discipline which speaks of control, whether it be military or any other kind of drill, is all to the good and is urgently required in our schools and colleges to-day.

Now let me refer to the second point, that of the recreative element. I think you will agree with me that the Boy Scout movement introduced to the Punjab 5 years ago has shown what real recreation can do in associating both master and boy in a new relationship. If Scouting stands for anything, it stands for the boy expressing himself, but it should also stand for the master associating himself not simply as a teacher isolated from his boys, but related in a vital way with his scholars' everyday life. I remember when I first began to consider this matter in the Punjab I was appalled at the apathy shown by the average master and teacher to this phase of the school-boy's life. It was considered as *infra dig*, for the teacher to be seen too much in the company of his boys. I was told again and again that familiarity breeds contempt, and that to retain the dignity of mastership, the boys had to be kept in their places. I am glad to say that that spirit has changed and Scouting has shown that where the master has been prepared to sink his dignity of office, and moves freely with his boys, shows them that he himself can take hard knocks and give hard knocks, shows that he can enter into play and recreation just as heartily as the boys themselves, and in many cases do it better; then he has won the regard and admiration of every boy in his class and it is not a question of losing his dignity or the honour of his position, but a greater and more honourable position has been given him, for he has ceased to exist as one who is out to make life as hard and difficult for his boys as he possibly can, by giving them lessons which were distasteful to them; but has given them a new vision of what recreation, fun and laughter really mean.

That brings me to my next point, namely, building up the physical health of the boy. No real good can come unless the exercises are systematically graded and here I would refer to the Urdu publications of Mr. E. C. Earl, late Adviser in Physical Education, Punjab. There the lessons have been carefully graded to suit the different ages of all classes. I need not emphasize the point here of the harm that can be done by certain exercises being given to boys at a wrong age. The age groups are clearly defined and it should be the object of the physical instructor to see that neither in games nor in calisthenic exercises should the boy be over-strained or given anything to do which is not suitable for him at his age. The teacher must know his pupils' power and limitations. He must also be able to awaken their interest and to hold their attention and to build upon what has already been learned. There is no subject of education which lends itself so much to the use of imagination as physical training, and in dealing with the boys of the primary grade the imitative games, the romance of play and the fun-giving games which the small boy loves to play ought to be encouraged if the best results are to be obtained. It is the enthusiasm of the teacher which begets the activity of the pupil and if the physical training teacher appears before his boys in a lackadaisical manner with no more life in him than you would find in a person already half dead, with no more movement about him than you would find in a man who was decrepit and old, then it stands to reason that the value of the training to the boys is negligible and the results nil.

Activity is the first essential and must be maintained right to the end of the teaching period, otherwise interest flags and the drill movement become merely mechanical.

Now, in closing, I wish to touch upon how to apply physical education and training both to teachers and scholars. Sir George Anderson, this morning, in his address referred to the new physical training class which is being run in the Central Training College and said that a new departure has come about and emphasis is being laid upon the training of a number of graduates who will be able to go out and supervise physical education in the divisions, districts and schools and will also be attached to normal schools and intermediate colleges. One cannot but emphasize the value of such a movement on the part of the educational authorities, and that it is a step in the right direction all will admit. It is now for the members of the class to demonstrate their worth and the future alone can show whether the experiment will justify itself. But this alone is clear, some of the best of our younger teachers are coming forward for training and they will be the pioneers of the new effort, of building up the physical life of the boyhood of this great Province. It is training and yet more training of masters and boys that is required and every training centre must have its trained expert in physical training, so that a greater number can be trained and supervised in furthering the work that has begun.

PRESIDENTIAL ADDRESS TO THE CO-OPERATION SECTION.

CO-OPERATION AND THE NATIONAL GOOD.

BY C. F. STRICKLAND, Esq., I. C. S.,

Registrar of Co-operative Societies, Punjab.

I have observed a tendency among the educated classes, and even among some of the educators of this country to view co-operation in an unduly narrow light, and I wish to direct your attention to its broadest aspect. In the first place it is definitely *not* the department of co-operative credit, and I am anxious to lay stress upon this since a misconception in the matter prevails in unexpected quarters. Co-operators in such countries as Denmark and Ireland, which like India are predominantly agricultural, have described co-operation as a movement of rural reconstruction, but bearing in mind the very different aims of urban co-operators in England, where consumers' societies prevail, I would rather describe it as a movement of national reformation. I ask you to join me in considering it in this light.

Co-operation, as I understand it, has three objects. In the first place, it aims at securing an economic profit for those persons who accept its doctrine and submit themselves to its very rigid rules. All persons, rich or poor, townsmen or countrymen, are entitled to secure its benefits, but whereas wealthy persons are often able by the use of their own capital, influence and brains to win for themselves advantages in respect of their business or their personal education and development, it is impossible for poor men or men of limited means to attain the same results, if they remain isolated. Whereas co-operative organisation is useful for everybody it is essential for the economic success of the weak or the poor. Secondly, the co-operator is engaged in building up citizenship in his own country. It is not sufficient to seek an economic end, nor is it possible to engage in any economic activity in accordance with co-operative rules, without a moral improvement which is none the less real though it may be gradual and unconscious. No man can be trained in the wise use of money, in punctuality of repayment, in the thoughtful ordering of what he buys or in the honest and regular preparation of his goods for sale, without being rendered thereby a more upright, a more prudent and a more thrifty citizen. The object of farsighted co-operators is to revivify the national life by making it more diverse and consequently more interesting. Whereas the two former aims of the movement were primarily economic and ethical, we now find in it also a social value which should in my opinion appeal with the greatest force to those who are engaged in national education.

It is consequently this last function of the co-operator on which I intend to dwell to-day. You are yourselves either teachers of the young or guides of such teachers. It is a platitude to say that education is not merely the imparting of instruction, and that the pupil—the citizen of tomorrow—is not merely a goose to be fattened for his examination. You have, I know, other and wider ambitions than this, and are conscious of the place which the teacher must take in forming the fibre of the national body. He is not merely to develop intellectual skill but also to make better men and wiser citizens. Above all, it is unsafe—and I use this word with intention—to set up an edifice of responsible government on a foundation of illiteracy and ignorance. India is feeling her way towards self-government, and those of us who are willing to ignore battle-cries and look at the real facts can realize how far she has already gone on that path and how great a step she may expect to take in the near future. We must all therefore educate the electors in whose hands the power will lie, and for my own part I do not believe that this can be unless the teacher and the co-operator are working side by side towards the same end. Perhaps you will forgive me if I say that some teachers, and no doubt also many co-operators, have not realized the greatness of their task, and that they will fail to achieve it unless they remain students as well as teachers to the end of their lives. There is no end to learning, and every advance in knowledge causes the true student to realize the immensity of what he does not know. It is my constant object as Registrar of Co-operative Societies to remind myself and my staff of this need for study, and I ask you also to consider whether you bear in mind, as much as you should, the need for constant reading on subjects which lie outside the field of education as ordinarily understood. Unless we all know more about each other and each other's work, much of our effort will be misdirected, and we should take every opportunity of becoming familiar with different points of view and of reading books which do not directly lead towards advancement in our own profession.

What I have been saying may appear to you remote from Co-operation, but I do not for one moment think that this is so. The co-operator and the teacher are natural allies in the struggle to dispel the darkness which hangs over the illiterate classes of this country, both in villages and in towns. After some years of co-operative work I have formed a very strong opinion that the principal evil in the Indian village, and in somewhat less degree among the poorer classes, of the Indian towns, is a continual boredom. Their life is entirely without interest and without variety. The agriculturist at least works in certain seasons from morning to night at monotonous and interminable tasks, while at other seasons he has no occupation throughout the day or night than to get into mischief. Half the crime and more than half the apathy and obstinacy which are found in rural areas are due to this dreary dullness which is a feature of

rural life. The evil is not peculiar to India, but is found in all countries, especially those in which rural organization for work and play are least developed. A little book "Rural Education" by Ashby and Byles will give you a picture of Oxfordshire very similar to that which I see in villages of the Punjab, and I recommend it to your reading. The same idea was expressed by Lord Salisbury, when as Prime Minister of England he said while discussing the improvement of rural conditions, "Give them a circus"; in the present day he would have said a cinema. Cynical as this remark may appear, it contains much truth. The villager in all countries is apt to be bored, yet I do not feel that this is inevitable. If he were literate, if he had access to books, if his economic life, his moral being, and his social surroundings were all organized, his life would be far less dull than it now is.

It is for this reason that Punjab co-operators are not content to form societies of credit, purchase, sale or even thrift, but concern themselves also with questions of education and hygiene, with the avoidance of litigation and with all forms of moral and social activity, which better organized and better educated countries are accustomed to regard as outside the co-operative field. We wish not only to secure for the people economic gains or savings but also to widen their views, to add to their social interests and to raise their moral standard in every way. We have, therefore, co-operative societies for these less directly economic objects as well as for the making and saving of money. We are, however, hampered in all our efforts by two constant difficulties; the illiteracy of the mass of the villages and of the poorer classes in the towns, and the lack of a resident leader who will inspire them and help them to make an effort on their own behalf. In the majority of cases the only possible leader is the resident teacher, and I wish to appeal to all educators in this country to understand how great a need the village has of their help and how greatly they themselves can be benefited by helping the villagers. The schoolmaster, if he is a man of high character, will be regarded as the one disinterested person who can be trusted in case of disputes. If he is acute-minded, his advice will be valued in making the rules of a better living society, for the limitation of ceremonial expenditure. He will win the confidence of the people by joining their credit society without intending to borrow, or if he does not wish to join, by writing their simple accounts wherever they have no literate member who can act as secretary. We should not forget that schoolmasters were numerous in the group of educated men which first founded co-operation in Rumania, that schoolmasters led the national revival in Denmark of which the Folk High school are so marked a feature, and that the schoolmaster of England to-day, in town or village, is habitually the secretary of one or more local organizations for music, for the drama, for thrift or even for the cultivation of small holdings.

I have extracted a few instances from pamphlet No. 46 on Rural Education published by the British Board of Education. It is there pointed out that teachers are taking an active part in organization for the advancement of agriculture and horticulture, as well as in those social activities which make life in village communities more interesting and more wholesome. Nor is this work confined to the villages. Reference is made to teachers in London and other large cities who are expert gardeners and give courses of lectures to allotment associations. They have been busy also in the formation of allotment societies, poultry societies and bee-keeping societies. Three or four cases are specified in which the teachers of London schools have either themselves founded such associations or are taking a leading part in their management. In secondary schools of the rural area there are teachers who lecture to farmers, advise them on the improvement of their pastures, form clubs for adolescents, give expert advice to bee-keepers and gardeners societies or are chairmen of egg societies and similar bodies. The head teacher of a school in the south-west of England is chairman of an egg society which during 1925 collected 75,000 eggs from the local zamindars. Teachers in primary schools have naturally more opportunity for varied assistance to their neighbours. Many women are employed in teaching in England and these in their turn are engaged in organizing girls' clubs, nursing and first-aid associations, musical societies, etc. The men are similarly interested in pig clubs, milk-recording societies, dairying, poultry keeping and athletic clubs. They are employed as expert judges in agricultural and horticultural shows. They are secretaries of the local thrift societies, and both men and women in all parts of the country work as librarians of the village library maintained by the County Council. The head teacher of a village school is a Director of an Asparagus Society operating over a wide area surrounding a market town, while the founder and chief organizer of the biggest egg society in all England, that of Framlingham in Suffolk, was the head teacher of the local school. The English teacher does not add these tasks to his ordinary busy life because the Education Department orders him to do so, he does not consider that he is performing an act of benevolence, he is carrying out his ordinary duty and helping as an educator the improvement of the entire life of the community in which he lives. Here in India there are no doubt difficulties of caste and religion which make it more difficult for a teacher to assume the same position, nevertheless I do not believe it to be impossible. I have co-operative workers who are entirely successful among men of a different religion or a different community from their own, and who are respected and valued by the people because they are impartial as between man and man, and yet show themselves anxious to enter into the life of the people, adding interest to it as well as making it profitable. The schoolmaster can do the same if he wishes, and he will find the co-operative staff ready to welcome his help wherever

sincerely given. We need literacy as well as understanding, and it is the privilege of the schoolmaster to supply both. It is not merely the villager who is bored in a village, the same trouble afflicts the teacher also, and I am confident that he himself will find his life more pleasant if he will help forward the economic, the moral and the social improvement of those around him. An opportunity for giving such help is now offered to him by the part which he is expected to take in the promotion of adult education and the maintenance of village libraries. Adult schools as such are supported by the Education Department, but the funds for the village libraries are for the most part provided by the Rural Community Board. There is at the same time a Rural Community Council for each district, in which the local officers of education play an important part, and which, if successful, will excite in the rural areas an interest in all kinds of social activity. Here too the schoolmaster will find himself in touch with the co-operator. The co-operator desires to make the life of the countryside organic, to fill it with new ideas and to open out new fields of action. It is impossible to suppose that villagers in their present state of weariness and with their limited outlook will organize themselves spontaneously; they must be—not forced—but encouraged and stimulated to think for themselves, to think about other things than their daily bread and to acquire the sense of community. I am not myself a great believer in the reality or value of the old village panchayat, which appears in every picture of the Indian golden age. If such a panchayat ever existed and had power to control the life of the villager, I suspect that it was as often unjust as just. I do not intend to make hereby any imputation against the Indian villager which I would not as readily make against the villager of most other countries. There are not many isolated groups of men in any country of the world, who can be left to conduct their own affairs on a basis of economic inequality, and in which the strong would not frequently misuse their power to the detriment of the weak. We must not look back at the past but forward towards the future. If in place of a council of village graybeards deciding the affairs of the village under the pipal tree, but deciding them as happened to suit the convenience of the more fortunate among themselves, we could create a village community of equally intelligent and equally independent men, economically rich or poor, but socially free to express an opinion and be sure of a hearing, we should have gone far to add real interest to rural life and to introduce the sense of liberty in a sphere in which, despite all the pictures of the golden age, I do not believe that it has ever yet existed.

With this object in view I ask you to consider whether a cultivator who lives from hand to mouth, paying over the bulk of his produce, if not the whole of it to a money-lender who has financed his sowing and his ploughing, and merely turning to the same master for every one of his daily needs, is a man of whose life India as she grows towards national unity and national

consciousness, can feel proud. Such a man is only too often unambitious, selfish and obstinate. He can have no idea of national progress and little sympathy with his fellow countrymen beyond the range of his own eyes. Better farming means nothing to him, since the profits go to his creditor; better cattle serve no useful purpose, since he has to give them more food, and hand over still more to the same master. Better living is a conception altogether outside his range. The Government is merely a tax-collector, and India is to him not even a name. It is this desolate picture of life which co-operators wish to alter and in the alteration of which they ask for the alliance of the schoolmaster. I am absolutely convinced that in any village in which a schoolmaster supported heartily the cause of co-operative credit, the villagers would be strengthened in their struggle to release themselves from the bondage of debt, and might begin to comprehend that a fellow citizen who lives a life entirely different from their own, and who may be of a different caste and a different religion can nevertheless feel a real sympathy with their troubles, and is moved to help them with no object of his own to gain. To the majority of illiterate men in villages I believe that this idea is practically unknown, but it is an idea which co-operators try to instil into the members of their societies. The schoolmaster has greater power than any other person to enforce the lesson by his teaching and his examples. If he will repeat to them that every man, however poor, can always save something from month to month and from harvest to harvest, and will illustrate this by joining a thrift society, if he will try to convince them that good material is not only better than bad material but is also frequently cheaper in the end, and will join in ordering through a credit society or a separate supply society whatever he and they need from day to day for their personal use or for their homes, if he will sit with them in meeting to discuss the remedies for excessive drinking, for litigiousness, for extravagance on ceremonies, or for the giving and taking of bribes he will acquire and exert an influence in the small community around him which will give valuable strength to the co-operative societies and will win for him a unique and honoured position in the village. The five classes of society which I have indicated, those of credit, thrift, supply, arbitration and better living, are all types in which co-operators suffer from lack of literacy and in which the aid of the schoolmaster can effectively be given. There are very few villages in which at present literacy is so widespread that no society of these types would require a schoolmaster as secretary or as a member of committee and if there are any such villages, their inhabitants have reached a point of independence at which the master will be able to associate with them as equals instead of guiding them as children. In either case both he and they are gainers. I should like to ask every one of you here to encourage co-operative societies of every kind in the village and the town, because they are a sign of national

progress and a necessary element in national organization. They are not merely the fads of a peculiar Government department, they are the life of the people, and without them the people, and the rural population in particular, will advance less rapidly and less surely towards the goal of India a nation.

We co-operators in return have something to give. The various kinds of co-operative societies which are concerned immediately with schools and schoolmasters will be discussed in detail in the Co-operative Section of this Conference. I would only remind you at present that more than half of our 550 thrift societies with their Rs. 3 lakhs of savings are working among and for the benefit of teachers in primary and secondary schools. Apart from the direct benefit of saving they contribute something also to personal character, and a teacher will be and become a better and more intelligent man from day to day, as he is trained in thrift and in thoughtful spending. Again we have a hundred or more supply societies in secondary schools which bought and sold last year goods of the value of Rs. 1 lakh. I will not say that they are all first class, they vary from the excellent to the indescribable. Where, however, they do well, they teach both masters and boys the advantage of buying in common what they need, insisting on good quality and reasonable rates, and distributing the goods amongst themselves with impartiality and on a basis of clear accounts. We have our own objects to gain, and are glad to see the idea and meaning of Co-operation spread among the young, but you will not grudge us a return, if we are able to perform for you a service. Similarly co-operators desire to fill your schools, in their own interests as well as yours. We have a number of compulsory education societies, in which the parents are pledged to educate their children continuously up to the 4th class. Such societies are only required in areas in which the Primary Education Act cannot yet be enforced, but wherever it can be introduced, we are delighted to be abolished. Co-operators compete with no useful activity of Government or private person, and aim only at securing a desirable result by any honest means. You will no doubt be interested to know that the pledge which the members of such societies of compulsory education, take, with regard to the education of their children is seldom broken, but where it is broken, the committees impose a fine as authorised by the by-laws, and we have one instance after another in which the offender has paid the fine and continued his membership in the society and the education of his children in the school. But we cannot afford to wait until the children of to-day are educated and grow up. We share with you a belief in the value of adult education, up to the primary standard in the first place and as much further as we can carry it. We pride ourselves on having founded the first adult school, but the Education Department has now left us far behind, and wherever possible co-operators hand over their schools to the local body when it is willing to take them.

You will readily agree that mere education up to the 4th class, and the further instruction of a few boys in secondary schools, is not all that India wants. For one thing there is between the stage of compulsory education of juveniles and the later education of adults the long period of adolescence, for which no provision is made in this country except in the secondary schools. There are no young farmers clubs, no sporting clubs, and (outside the schools) few boy scouts and practically no girl guides. In other words the adolescent boy or girl is left to his own devices from the age perhaps of 12 until he is a man or woman old enough to understand how great an opportunity has been lost. One can dream of village schoolmasters, and town schoolmasters also, organising troops of boy scouts, debating clubs of young zamindar boys, hockey clubs on the village grazing grounds, or even—as in one English village—a company of boy scavengers—not sweepers by birth—who spend their spare time collecting all the old tins, clothes, papers, etc., which are lying about the streets of the village and selling them for a common fund. If the Gurgaon school of rural economy secures the results for which its promoters hope, we shall some day see a “village guide” in every village of the Gurgaon District, trained to promote and assist co-operative societies, rules of hygiene, plans of cattle breeding and a thousand other novelties. Where such guides do not exist, the only men who can help us are the schoolmaster and the co-operative organizer. The latter is always on tour, the former is resident and is consequently in a far stronger position to develop local life. If we all realize that patriotism is not a noisy virtue, that it does not consist in striking, and perhaps tragic, acts of history, but in the daily performance of small and generous tasks in the little circle in which each of us live, we shall interpret patriotism more truly than is ordinarily done, and we shall each of us carry it one step further. Do not be astonished at my discussing all these matters before you and calling them Co-operation. *They are* Co-operation and I refuse to interpret it in any narrower way. It is a re-building of the nation by teaching every citizen thrift and wise expenditure, cleanliness, peacefulness and truth. Men are willing to learn but they cannot understand, partly because they are literate and partly because they have no local leader among them. You aim at literacy, and we welcome and will in every way support your efforts, but in return I ask for local leadership, or where it is already present I ask for the use of your brains and your real sympathy. We are travelling on the same road ; let us join hands.

PRESIDENTIAL ADDRESS TO THE ARTS AND CRAFTS SECTION.

BY LIONEL HEATH, Esq., I. E. S.,

Principal of the Mayo School of Arts.

MANUAL TRAINING IN EDUCATION.

I very much appreciate the honour of being requested to preside at the Arts and Crafts Section of this Conference and being asked to give a presidential address. I feel most sorry that owing to being on leave at the time of your meeting I shall be unable to be present. I must convey here my very grateful thanks to Dr. Whitehouse for consenting to read this paper.

At an Educational Conference of this importance, which I anticipate will have useful and far-reaching results in helping educationists to arrive at clearer and perhaps broader ideas of this educational requirements of India, I interpret the aims of this Section's meeting as an endeavour to find a proper place in education for the Arts through the medium of drawing and manual work.

You will forgive me if I take an unorthodox view of the importance of art in education. If you disagree with me it will at least help you to argue the opposite view and so the air may be cleared for a better understanding of the two points of view.

I see no evidence in India that the Arts, or perhaps I had better use the term the Fine Arts, have any place in, bearing on, or relationship with, our educational system. As far as I know there is no professorship of Art, or lecturership of Art, in any University in India. No University gives a degree in Architecture or any other of the arts, nor am I aware that Art is a subject in any of your colleges for lectures or lessons, or considered a subject bearing upon the development of man, or relating to culture and civilisation. I would ask you to enquire from your students how many could give you the names, and some of the works, of the great artists of the world or how many could tell you anything of the history of the rise and fall of art in India. Does it never strike the educationists as extraordinary that though thousands pretend to an understanding of the inspiration and beauty of Shakespeare's writing not one per ten thousand has the least understanding or desire to understanding the spirit and teaching of the great artists. If this is true of Western culture it is even more true of Indian culture.

I am not in any spirit of criticism, but in order to get a clear idea of where we stand and of our responsibilities. Art and beauty and truth as subjects of education. You will say that this is impossible. We can't do without ideals; it

is equally and no less idealistic to contend that the study of literature and the beauty of thought and words has this high cultural and moral influence. The highest cultural value of ideals is that they are in contrast to the commercial and materialistic world we live in. But there is another point of value in the study of Art. Art is not an aesthetic luxury only, it is capable of immense practical application and in this Conference it is in this aspect that we have to consider it rather than the other, which may be left to the consideration of other sections if they so desire.

I think that it will be admitted by all of us that our educational system does not err on the side of being too practical. To come down to hard facts and leave idealism alone for the moment we may presume that a country is entitled to that form of education that shall best fit it for the needs of the time and one that shall give its youth a full chance of developing all its faculties and of becoming useful citizens. Most European countries now realise this claim and try to meet it. The London County Council employs artists and drawing masters as peripatetic teachers in its council schools to give lessons and lectures on drawing and painting applied specially to nature study and design. The Swiss National Schools, which have justly the reputation of giving the best form of national education, employ artists as whole time professors of Art and the studio-class rooms and the work of the pupils are usually an object lesson in efficiency and high standard to the educationist. The development of kindergarten teaching into manual training in industrial centres is an easy step in countries like Germany and Switzerland where teachers practice an honourable profession and are people of great influence.

Drawing in these countries is not a tedious routine ; it is a live study which claims the most enthusiastic interest of both teachers and pupils. It does not stop at copying, it is used both as a means of expression and as a source of inspiration to the child's mind and its inventive faculty. It is related by design to the girls' home life and to the boys' practical work. Without this relation to the child's life it loses most of its educational value and becomes a lifeless exercise. In my view, no art, literature or education can be judged except in relation to the time it was born in. We do not want the writings of Chaucer or the paintings of Raphael in our day and so in education we do not want tradition, we want a live system.

The modern developments in education are still somewhat of a shock to the conservative academic teacher, who thinks secretly that we are falling out of the frying pan into the fire ; that a country that can no longer produce the writers of beautiful letters that were plentiful in the time of our grand-fathers is in a parlous state. Other times other customs. We are living in the present and we produce men who do things. Whatever may be said against the present state of civilisation, this is an era of

scientific and artistic advance ; where in the past things, of utility and rare beauty were the prerogatives of the rich only, now these things are at the door of the man in the street ; where we built beautiful cathedrals, we now build comfortable and beautiful homes. Being an artist I regret, but being a man in the street also, I welcome the things of beauty I have.

If the modernising of education is a necessity in the countries of Europe and America, highly developed both scientifically and industrially, with a people skilled in production and born to a practical outlook I think it is an incontrovertible statement to say that India with a people, traditionally skilled in hand-work, with magnificent buildings and arts to their record but undeveloped in modern arts, science and commerce requires more urgently a modern educational system.

The last few years in the Punjab have seen a great advance in bringing education up to modern needs in many directions—Agriculture, Co-operation, Commerce, Physical Training, Public Health and Social Service are all receiving very serious attention in schools. I admit that a like consideration has been given to the teaching of Drawing and Manual Training and within certain limits some progress has been made in bringing these subjects into line with modern ideas but chiefly owing to lack of good teaching the results are such as to lead the public to think that these subjects have little or no educational value.

It is not my duty to dwell on the causes that have held back the progress of the practical side of education. We have not the money, we have not the teachers, we have not even a popular sense of the necessity for such progress. We have been trying to carry on without these three essential and of the three the last is the most fatal and deadening to our efforts. If we had this popular demand the other requirements would follow in India as easily as in other countries.

In considering the bearing of drawing and craft-work upon, and in relation to, education I wish to give a word of warning. In this matter perhaps more than in any other "a little learning is a dangerous thing." When that little learning is expounded by teachers with insufficient technical knowledge the dangerous thing becomes disastrous.

We shall never get the true value of drawing without the most expert and enthusiastic teachers and we shall never get them unless we give them a pay and status at least equal to that of any other teacher. Owing to their inferior educational qualifications in the past and the ignorance of headmasters of their subjects the drawing master and the craft teacher are held of no account, it is they who are at the beck and call of the others, who are deputed to fetch and carry the Inspector's hand luggage and run with messages. Such an attitude towards these teachers is bound

to belittle the value of their teaching, to bring the subjects into contempt, and rob them of any enthusiasm they may have had.

The educational value of drawing is more easily understood by all than that of manual training. It gives, through the lessons learnt, a definite additional power of expression and one that comes naturally to children and only requires developing. As writing requires thought and knowledge of grammatical construction so drawing requires thought and power of visualisation with, as in writing, technical skill. The necessary skill is only the servant of more important qualities, writing may be bad but readable and adequately convey beautiful thoughts, imagination, observation or truth and so it is with drawing and painting. The great artist Watts stands out as a poor painter with great thoughts and beauty of inspiration. Because it is easier to understand technical ability than more subtle and valuable qualities, the ignorant attach undue importance to dexterous drawing and insufficient importance to truth and beauty. Thus how often do we see in schools carefully executed drawings in wrong proportion or bad form and poor drawings elaborately painted.

Bad teaching in manual work may be unlearnt if craft is taken in the boy's profession but bad drawing is a bad mental training and is, like a bad habit or a bad accent, rarely unlearnt.

The training of drawing teachers becomes therefore the most important question for the consideration of this Conference in the sectional meeting. In addition to having had ten years' experience of teaching in an Art School at home I have had the training of drawing masters here from 1911 to 1922. So I think I may claim to know something of the art of teaching and something of the difficulties of training teachers in India. I believe it was thought by some that the School of Arts, when it trained drawing teachers, was trying to make artists of the teachers. We were not, but I believe that a pupil under a clever artist or a skilled craftsman will learn more than from the most highly trained teacher without the art sense. It is true that the artistic ability of the students was in advance of their powers to teach but this was due to the low standard of the educational qualifications of the boys and not to excessive artistic training. In a word a lack of balance between the two sides of the trainings resulted. This lack of balance was overcome to a great extent during the later years by recruiting matriculate students and reducing the training from three to two years; the results fully justified the change.

The point I want to emphasize is that if you want good drawing teachers you must give them a training far in advance of the matter of the lessons they will have to give to their classes, first, because with a little learning they utterly misjudge the object of teaching drawing and treat it as a subject to be learned by rote, and secondly, drawing is a subject that cannot be crammed up

before a lesson, as may possibly be done with book knowledge. The ignorant drawing teacher has a fixed conviction that what he sees is correct and that all he has to do is to acquire enough skill to translate it to paper. He teaches his class by the light of his own imperfect understanding. The real fact is that what he sees is mostly incorrect and the most difficult part of his work is to train his eye to see and his brain to retain the impression, the necessary manual dexterity required in drawing is almost an automatic result of the eye and brain training and comes from practice only, and has little more bearing upon the subject than a good handwriting has upon the knowledge of a language.

This may appear a bold statement and one not easily accepted because it has become the habit to look upon drawing as the end instead of the means only. I want to rub this point in as it is the crux of the whole matter of teaching drawing in schools. Let me illustrate this by a simple example. You are shown a drawing of a tree—it is obviously a tree and not a man, it has leaves of sorts and a trunk and branches, it may be painted green. It has therefore some elementary truth in it and it is even possible that it is quite a pretty drawing to the uninitiated, but the point is, has it those truths which show powers of observation, a trained eye for form, a sense of proportion and construction? None of these are artistic qualities though they are of course included in, and essential to, the highest artistic work. These things are merely what a drawing must express if it is to be a means of expression and an exercise of educational value. How many of our teachers of to-day could tell you whether a drawing expresses any of the truths that it is essential it should express? It may be amusing to see a child draw a horse or an elephant with the right number of legs and a trunk or tail, it may even show some powers of memory or an elementary power of observation but as an education it is a delusion. Drawing can only be taught by appeal to the understanding of the child and by connecting it with the life of the child; combination of these two factors must govern the lessons and it is obvious that the proper understanding of the construction and natural characteristics of an animal must come at very much later period in his life.

Manual Training :—These exercises are designed to teach a boy observation, accuracy and manual skill. The lessons are arranged in steps of graded difficulty and skill so that if the teaching is sound each step is completed before the next is taken up so as to show that the boy has learnt what he can of the hand and eye training demonstrable by the exercises. What we see is that in the greater part of the work neither observation, accuracy nor skill is shown, if these three functions are not exercised it is obvious that carelessness, inaccuracy and lack of skill have been taught. The repetition of the exercises only serves to perpetuate and establish these faults and this is where the dangerous element enters. We have the appearance of teaching sound methods but the results are fundamentally bad.

In practical work of this nature the first essential in all the lessons is that the pupil shall be taught and thoroughly understand how to handle and make use of his tools. This can be taught by demonstration only. In his training the teacher has to learn the dignity of skilled labour and must be prepared to take off his coat to his job when he is teaching and show his class that he not only understands his work but that he is proud to demonstrate his skill. A class will learn more of the true inwardness of manual work from a skilled craftsman with no teaching training than from the best school-trained teacher; we have also to face this fact, that a skilled craftsman earns more than a well-paid teacher and that a second best craftsman or teacher is no good to any one. This fact is not recognised, and it is this that is the primary cause of the failure of the industrial schools in this country.

There is another to be considered. Are these exercises properly designed to develop the powers we desire? Is it educationally sound to teach methods of work and construction never after to be employed or only employed by shoddy workmen? Or to put it in another way are we getting all we might out of these exercises if they were better designed? I am not a manual training expert, I am a craftsman, so I will put a point of view for your consideration which will I hope help you to answer these questions.

Manual Training is not a technical training but an education. It may be compared to the home teaching of a boy whom we wish to make receptive of knowledge in the future when he goes to school. We make our information relative to his powers, we try to tell him only what is true though we may leave untold much that is true that might be beyond his powers to grasp. We sow a seed suitable to ground that will fructify it, so that the plant may be healthy and well developed. If on the contrary the child is told untruths with the mistaken idea that he will not understand the truth, or he is taught wrong actions because we are ignorant of what is right, these things not only have to be unlearned but we are preparing his mind to reject instead of to receive education. It were better to teach nothing, for if the boy, of his own inquisitiveness, gathers something that is wrong he will correct it later without harm.

My view is that the power to make things in a craftsman-like way has an influence upon character building quite apart from the material value of the knowledge. But this influence necessarily depends upon the soundness of the knowledge imparted. It is my doubt of the soundness of the manual training lessons in use that leads me to suggest in a very sketchy way, what I consider is the true aim of manual education. We want to give the pupil a direction in which to use his creative ability. This ability is undeniably possessed by all children more or less and is seen in his endeavour to amuse himself by representing

something he has seen in a drawing or by playing in the mud of the streets. To give full value to this teaching, it is done through the medium of paper, card-board, clay and wood, the first two enabling simple exercises in colour, pattern making and construction to be incorporated in the lessons and so the elements of geometric design are taught. Through the medium of clay, irregular, circular, naturalistic, and curved forms are introduced and nature study and powers of observation are initiated and encouraged and design is carried a step further by being built up and modelled in relief. As the boy comes to an age to be trusted with cutting instruments, wood is taken as the medium in order that what he has learnt of exact measurement, knowledge of form and working with his hands may be translated into a more permanent material.

At this stage the work is related to botany; the growth, development and structure of trees; the nature of the different kinds of wood and their uses in the objects in use in every day life. In all its stages the work is necessarily closely related to drawing, form, and the use of mathematical instruments but in this last stage there is the additional difficulty of the manipulation of dangerous tools. The proper handling and effective use of these is regulated, first, to guard against damage to the pupil, the tools or the work by ill use, and secondly, to obtain the effective results which the tools are designed to give. Even the proper sharpening of a pencil or a chisel may be made a lesson in manual dexterity and intelligence.

The steps in the training I suggest are as follows :—

1. A knowledge of the materials in which the work is done.
2. A demonstration, constantly repeated by the teacher, of the method of using each tool, the work it will do best and why.
3. Exercises in simple methods of cutting shapes with the saw after marking out to accurate measure with the marking gauge, ruler, square and pencil.
4. The use of the plane in finishing to the most exact measure.
5. Craftsmanlike joints to be used in making small objects, the use of the right chisel and saw for these, the drilling of holes and the driving of nails.
6. The mortice joint and its application, the preparation and methods of using glue for fixing this without assistance from pegs or nails.
7. The care of tools, the sharpening of chisels on the oil stone.
8. The making of objects made possible by the exercises learnt to this stage.

At this point the pupil should be shown and made to draw all the simpler methods of joints used in joinery, the purposes they are intended to achieve and the objects in which they are utilised. From this stage onward the minimum amount of time should be spent in exercises and maximum time given to object making. The only joints permitted to be used should be those which a craftsman would use for the purpose.

We who advocate a thorough system of drawing and manual training in schools, do so because we think that a literate education by itself is incomplete at the present time having regard to the future of the mass of the people and because we believe that these studies have a strong influence in the direction of building up character, self-reliance and good taste and so help to complete and balance the education of modern youth. That they lead up to vocational education and productive power is an added reason for their inclusion in our educational system at this time in India. My own view is that vocational schools at present are only an attempt to correct defects in the earlier education and that until the system of educating the boy is sound, vocational schools will not be a success. Those of us who have had anything to do in the training of Indian boys must have been struck by their helpless difficulty in mastering simple practical processes. The work the Education Department is now doing through its Normal Schools, through its Central Training College, through its Inspectors, through its Rural Community Board, and its Village Councils is intimately related to the needs of the people and implies the recognition of the widest possible interpretation of the word Education. This recognition demands the most progressive advance in the quality of our teachers. We have many able men in our ranks of teachers and those of them who are here to-day and who will give you the fruits of their experience must realise the colossal nature of the problem of training the teachers of the future. When I think of that problem and the individual effort that hundreds of you have to expend in the attempt to solve it I have nothing but respect and admiration.

I have done nothing more than indicate some defects. I have seen from outside, the progress of a small section in education. The papers that will be read to you by those who have been concerned in the supervision and teaching the practical course will give you an entirely different point of view to which the greatest attention should be paid. I only wish I could be present to hear the other side and to give you my assurance of my knowledge of the inadequacy of this paper to put the subject before you in all its intricate bearings.

When the papers before you have been read and discussed I hope you will be able to pass a resolution embodying your sense of the importance of art as a subject of instruction in education and your conviction that Drawing and Manual Training are essential steps in that direction.

PRESIDENTIAL ADDRESS TO THE ADULT EDUCATION SECTION.

BY KHAN BAHADUR SH. NUR ELAHI, M.A., I. E. S.,

Inspector of Schools, Lahore Division.

His Excellency the Governor in his opening speech remarked that Education is a comprehensive subject. This, in my opinion, is pre-eminently true of Adult Education, of which the scope should be as wide as the interests of the men and women to whom it makes its appeal. To give you an idea of its aims I cannot perhaps do better than quote from the report of the Adult Education Committee appointed by the British Parliament to consider the provision for and possibilities of Adult Education (other than technical or vocational) in Great Britain and to make recommendations. The report says :—

“ The Adult, even when he has forgotten most of what he learnt at school before he was fourteen, cannot be put back to the spelling book and the multiplication table. In the interval between fourteen and eighteen he has been receiving an education, formless indeed and fragmentary, but emphatic enough, and in its way effective—the education of practical life. His adult education must be taken up at this point and on this plane. It must work from his existing avocation and interests, must begin by answering existing enquiries and perplexities and go on to the satisfaction of his aspiration. It must show him the reasons that underlie his daily work, the way in which that work has come to be arranged as it is, and how it can be arranged better, the relation of his work to that of others, and its place in the economics of the nation and the world.”

An interesting commentary on this principle of approach is supplied by a story which a member of the committee tells in another part of the self-same report. He says :—

“ A northern town developed to an amazing extent the formation of adult classes. On one occasion its representatives went to a Carters' Union urging them to say what they wanted to study. Perplexity reigned until one said, ‘ We are always behind the horse. We don't know much about him. Let us have a class on the horse.’ As a result a hundred and twenty carters attended a class for two successive winters. It is said that the horse in that town had a much better time ever after.”

Viewed from this standpoint, adult education presents a problem which is to be tackled not only by the educationalist but members of all the beneficent departments and even by the politician and the social reformer. The model farm, the co-operative bank, the cholera and plague charts and even industrial workshops can be as effective instruments of adult education as the school or the library. But as the last two

directly concern the educationalist, I think I should confine my remarks to these two factors :

First I shall take the adult school. In England and other European countries where elementary education to the age of fourteen is compulsory, the aim and function of an adult school is obviously to overtake deficiencies of elementary education or to recompense a man or woman for missing secondary school or university training. The Adult Education Committee I have already referred to consider it to be even still wider. For instance, the Final Report of the Committee says :—

“ The necessary conclusion is that Adult Education must not be regarded as a luxury for a few exceptional persons here and there nor as a thing which concerns only a short span of early manhood but that Adult Education is a permanent National Necessity, an inseparable aspect of citizenship and therefore should be both universal and life-long The opportunity for Adult Education should be spread uniformly and systematically over the whole community, as a primary obligation on that community in its own interest and a chief part of its duty to its individual members, and therefore every encouragement and assistance should be given to voluntary organisations, so that their work, now necessarily sporadic and disconnected, may be developed and find its place in the national Educational System.”

The same Report further defines the aim of Adult Education. It says :—

“ The main purpose of Education is to fit a man for life, and therefore in a civilised community to fit him for his place as a member of that community The essence of democracy being not passive but active participation by all in citizenship, education in a democratic country must aim at fitting each individual progressively not only for his personal, domestic, and vocational duties, but, above all, for those duties of citizenship for which these earlier stages are training grounds, that is, he must learn (a) what his nation is, and what it stands for in past history and literature, and what is its place among the other nations of the modern world ; (b) what are his duties to it, from the elementary duties of sharing in its defence and submitting to its laws up to the duty of helping to maintain and even to elevate standards and ideals ; (c) the economic, political, and international conditions on which his nation's efficiency and well-being depend ; its relation to the other constituent parts of the Commonwealth of British nations called the Empire, and the degree to which it can now or in the future enter into closer relations with other civilised nations for the just treatment of less developed races, for the furtherance of international co-operation in science, medicine, law, commerce, arts, and for the increasing establishment of world-peace

“ The economic recovery of the nation, the sound exercise of the new spirit of assertion among the rank and file, the proper use of their responsibilities by millions of new voters, all alike depend on their being a far wider body of intelligent public opinion after the war than there was before, and such a public opinion can only be created gradually by a long, thorough, universal process of education continued into and throughout the life of the adult.

“ Such a progress needs to be planned out at once and set going immediately as part of the general work of reconstruction”.

Adult Education from this point of view is not merely an adoption of a scheme for continuation schools at which boys and girls would remain till they are eighteen but it is a life-long process. It repudiates the idea involved in expressions like—‘ When I left school,’—‘ When I began life,’—which carry the suggestion not of milestones along the road of personal development, but, rather of a distinct and final passing out of one world into another, contrasted rather than connected with the first.

The Educationist of the West therefore seeks to correct this false notion and in the words of Mr. H. A. L. Fisher “ tries to draw out of a man all that is best and most useful in him, so that his powers may be employed with advantage to the community and to himself as a member thereof.”

For us, however, the problem is much simpler. In a country where the proportion of literates to the total population is below 5 per cent., the problem that confronts the educationalist is not the establishment of higher institutions for adult such as University Extension Societies of Working Class Athenæums or even to open continuation schools whose object is to provide personal culture and training for citizenship. No. Our aim at the present stage must be very modest and that is only to banish the demon of illiteracy and ignorance from our boundaries.

During the past few years the Education Department has directed its earnest efforts to the attainment of this end and these efforts have been remunerated in the unprecedented increase in the number of scholars. Not only has the percentage of pupils under instruction to the population of the Punjab more than doubled but our endeavours have led the population of many urban and rural areas to accept the principle of compulsion, without which no real progress is possible, for the education of their boys. This is, of course, very commendable. But it would be suicidal to remain content with this increase in the number of scholars in children's institutions. Were we to depend upon this alone we might have to wait for several decades before the Punjab could claim to be literate in the accepted sense of the word. There is besides the children another vital element in society that the Indian educationist cannot ignore by any

means and this is the illiterate adult. My view point here, of course, is that the home influence is of tremendous value and that the educated parents are the surest guarantee of educated children. Besides this the advocates of democracy will bear me out when I assert that democracy can survive only in an educated nation. So unless we educate our masses and the illiterate adults, the democratic forms of government will not be truly successful in our country. This, therefore, namely, the education of the adults, is an important and at the same time a baffling problem to which we have addressed ourselves during the past few years and which needs our best efforts to tackle it.

The two main problems with which every one of us is confronted every year while engaged in the work of educational expansion both among children and adults are, 'How are we to enrol more scholars' and 'How are we to keep them at school for a period long enough to ensure literacy.' With a view to devise a definite *modus operandi* for this far-reaching problem no carefully devised plan of attack has, as far as I know, been adopted and in consequence much of our work has been like that of men groping in the dark. The situation, further, is a still more embarrassing one. On the one hand, the masses appear to be totally indifferent to self-improvement and seem to take delight in their darkness, while on the other hand, illiteracy is sought to be stamped out through the agency of persons whose influence in society due to poor emoluments, low social standing and, in not a few cases to their mercenary spirit, can practically count for nothing. Persuasion is rarely, if at all, responded to by the obdurate and sceptical masses while an average teacher does not conscientiously believe in the blessing of education nor in the dignity of teaching or of social service. Another set-back in our country is the lack of voluntary interest. The history of the growth of education in England brings out one fact most clearly and prominently and that is that the advancement of education has depended, till the last few years, almost entirely and solely on voluntary efforts, inspired by religious and humanitarian motives. Adult education is specially and very particularly in need of this spontaneous service of voluntary enthusiasm. Private benefactions here are rare in the case of education except when, possibly, prompted by religious zeal or, in plainer words, by the denominational and sectarian spirit or even by sectarian rivalry. We have therefore to awaken the noble sense of charity and philanthropic work. And yet another formidable obstacle makes its appearance in our sordid ideal of education as kept in view by an average parent, *viz.*, service; the be-all and end-all of all education is *Naukari*. In its broader sense education is very rarely realised by many ignorant guardians. The present stage of transition which has brought in its wake the number of the educated unemployed in the limelight gives a man in the street an impression that education is useless and is solely responsible

for this state of affairs. This distorted ideal and point of view must, I am afraid, be changed through public opinion.

This pitiable plight of the masses coupled with the low and uninfluential position of an average teacher in society and the lack of voluntary interest makes the problem of adult education a very complex and intricate one. Yet in spite of these antagonistic forces at work we have to remove illiteracy by enlisting the sympathies of the people and by creating in them a demand for education. This is in itself a Herculean task which has to be accomplished, if education is to advance. The set-backs and the counteracting forces crop up in all movements but they have to be faced with a brave and stout heart. A movement which does not have to fight its way out tends to lose its freshness, vigour and enthusiasm. We have thus, even in the teeth of these drawbacks, to awaken the masses in such a way that they might realise that education, though not the panacea for all his woes and miseries, will still make his life fuller and therefore more enjoyable than he finds it at present.

The problem therefore turns round the question, 'How are we to awaken the masses?'

The first and the foremost need is well-organised propaganda work in the press and from the platform. The former can be accomplished by contributing articles in papers commonly read by the literate zamindars and the latter by informal talks by those who are held in esteem by the masses. Formal lectures by officers of the other beneficent departments will also go a long way to prepare the ground for the success of the movement. Secondly, we have to remove from the minds of our landed potentates the deep-rooted and ill-founded apprehension that education leads to a disorganisation of the existing labour system. This is, of course, not a new fangled idea, but it dates back to the earliest years of the present century and though education has since taken long strides, the apprehension persists as a sacred tradition with our rural magnates. We have thus by all means at our disposal to convince these worthies out of their wholly unfair nervousness. Once won over they are sure to be our truest allies, for opponents who become friends, after being fully convinced, turn out to be the most reliable supporters. Thirdly, we should, as the Department has already begun to attempt at Gakhar and Gurgaon, send out from our normal school teachers who know the ways of the people among whom they work, their traditions and wants and requirements and can be of use to them at all moments of need. This will stimulate love of knowledge by contact. Fourthly, the Civil Officers out on tour should make it a point always to address the people on the value of education. The talks of people not connected with the Education Department will, I feel, prove far more effective than the efforts of the members of the Education Department who in the mind of the ignorant are supposed to be driving all and sundry into school.

The suggestions made above are merely one form or another of awakening the masses by persuasion but this, as you will realise, takes time. For the speedy expansion of the movement the remedy lies in other measures, a few of which I might mention :—

A searching and thorough enquiry should be set on foot by the Department and the Legislature should lay down clear obligations on all concerned in the matter. Without the Legislator coming to the rescue of the educationists, the chances of success are likely to remain as uneven as heretofore. I should therefore suggest that—

(a) the responsibilities of the village headmen as well as of the Zaildars for the spread of education among the masses should be revived and a clear note and mention of this fact might invariably be made in their rolls by officers of the Civil as well as of the Education Department ;

(b) the Tehsildars whose sympathies have almost vanished since they have lost seats in the District Boards might also be reminded of their duties in this direction. Occasional talks by them while on tour or even a cursory query by them regarding the educational progress of a village will surely give a great impetus to the work of education ;

(c) other Civil Officers might also be requested to take more practical interest in the literacy problem of the Province.

2. One indispensable requisite for the appointment of any person to a public office, such as Lambardar, Zaildar, Member of the D. B., M. C., or N. A. C., or even to the town Panchayat, should be a pass in the literacy test. This is likely to popularise the movement a great deal and this action will give a great stimulus to men of the same category.

3. All public officers should carry with them a clear and explicit undertaking that the person so appointed will uphold the cause of education in his respective sphere of influence.

4. No man perhaps needs to be educated more than convict since a large majority of crimes is committed through sheer ignorance of one's duties and obligation towards society. Perhaps besides this, nowhere are the conditions for starting a useful adult school more favourable than in a jail. The difficulties of enrolment and of securing regular attendance are non-existent, while in every jail there must be a few educated convicts who could be entrusted with the teaching work. Just fancy that an illiterate adult leaves the jail as a literate person ! And what a tremendous impetus will the living example of this one person, once an illiterate, give to the Adult Education !

5. A very considerable push can be given to the movement if Industrial and Commercial houses, Factories, Government Railway Workshops, etc., urge their employees or rather make it compulsory for them to join the night school attached to them. Promotion in certain cases, I think, after a certain stage should be made dependent on their receiving a literacy certificate.

6. All Reformatory Settlements of the Criminal Tribes, without exception, should start adult schools. None needs education so much as does a member of the traditionally Criminal Tribe. It will be a case of true regeneration were these men to leave the Reformatories as civil and educated members of society.

7. A very successful means of awakening the masses to the necessity of Education is the education among the adult women. Whatever the present state of affairs may be, the only fruitful means—even Legislature is not so strong—is Female Education. An educated mother can never see her children grow up in illiteracy. A strenuous propaganda could be commenced in this direction, for in the case of a good many of our Indian women time hangs heavily on their hands. If educated women could help their illiterate sisters by starting adult women's schools, the Department would gain in the literate women the greatest supporters of adult education and of compulsion—in fact both will come automatically with the spread of female education.

As a further help to secure regular attendance and increased enrolment in urban areas I would offer the following four suggestions :—

(a) Persuasion alone, as a means of recruitment, has not gained a satisfactory response. If all officers—Civil and Police—and the Presidents of M. Cs. and N. A. Cs. possess practical sympathy, much can be accomplished in the minimum time. For instance, the illiterate police constable, chaukidars, peons and other menials might be pressed to join an adult school and secure at least a literacy certificate. For future vacancies the rule should require the appointment of a literate adult.

(b) To stretch the above point a little further I would go to the length of suggesting that all illiterate license-holders of Municipalities should be required to attend adult schools.

(c) Fee concessions in schools should preferentially be given to the children of the guardians who, being illiterate, are willing to make an attempt at securing a literacy certificate. Exceptions will surely have to be made as the rule, if stretched too far, might prove reactionary and retrograde.

This much about what the others can do in this connection. Now a little about ourselves.

To start an adult school the officers of the Education Department should first of all secure the co-operation of the Civil authorities. Before an ordinary village meeting for this purpose is held, the sympathies of the headman who might be asked to act as chairman of the meeting, might be completely enlisted. This will facilitate matters and if the headman wields the influence that he ought to through his office, his words ought to carry weight with the village folk. The convener of a meeting of this nature need not at all feel discouraged with small attendance. Strangely enough the policy of beginning work with a large and successful meeting often proves dangerous as people expect the subsequent work immediately to be on the scale of ordinary schools. The best and the more lasting movements have had small beginnings and this is a matter of great encouragement and consolation. At this meeting the advantages of literacy should be fully explained, keeping in mind the bearing it has on the occupations, business dealings, and the other matters of daily life of the audience present. We should remember that for the adults the taste and attraction for study depends upon conviction, for an adult cannot be driven to school. We have first to arouse in him a sense of personal need as well as of public duty. Besides, the life conditions of individuals have to be studied and this presupposes local knowledge as well as sympathy. As many members as can be recruited should be booked there and then, while a reasonable time should be given for others to get enlisted. The time and the place for the first meeting should then be announced and in that the daily hours should be selected. We should, by the way, remember that we deal here with grown-ups and not children. Everything should be done and all terms settled with the co-operation of the pupils. Adult Education will thrive only under conditions which allow of the fullest self-determination and the maximum amount of liberty in the organisation of the time and other vital matters and there should run, through all proposals framed, the spirit of co-operation and sympathy. The methods of teaching should vary; the books prescribed for the adults as soon as they have learnt the alphabet should be such as are suited to their tastes and requirements. From the very outset a villager should be made to realise that he is learning the use of a serviceable weapon and is opening for himself the door of a valuable store-house. The adult needs a very varied and interesting programme—instructive and informative and judiciously considered from the utilitarian view-point. It is not necessary to stick to the three R's day in and day out. To increase attraction popular Punjabee books, such as *Hir Ranjah* and *Bulle Shah's Kaffis*, might occasionally be recited from. Once a week for a short time news might be read from a newspaper of interesting articles from a monthly, or instructive passages from pamphlets of the beneficent departments. Once a week for an hour or two an interesting novel or a story-book might be continued as a serial reading. On Saturdays

or once a fortnight or even once a month an outside lecturer might be asked to deliver a short informal talk with or without the aid of a lantern. Occasional rambles and inter-school rallies might be encouraged. If an expert is available, informal talks on Astronomy, Art, Geology, Agriculture, etc., might also be arranged. Occasionally musical concerts might be arranged to which singers from neighbouring villages may be invited. A gramophone with a few good records could be another effective attraction.

Topics such as are broadcasted in pamphlets and posters by the Red Cross Society on Cholera, Consumption, Flies, Plague, Malaria, Infant Mortality should occasionally be presented before the adults for whom education should not merely mean the ability to read and write but a keener enjoyment of life and more refined standard of living. I would suggest that the community work should by all means possible be heartily encouraged, for, while the object of the adult school is to dispel the melancholy belief that grown men and women have nothing to gain by literacy, community work stands for the diffusion throughout the province and in every section of the society, the sense of wonder and curiosity and the gift of mutual sympathy and companionship which adds so much to the meaning of life. And this is exactly what is to be aimed at ultimately in all forms of adult education.

All touring officers might be requested to see the adult school and note their impressions of the work carried on. The adult students should form a Games Club of their own and should be privileged to use the school playground, if one is close by.

All adults passing from our schools should be awarded literacy certificates. For a pass in the literacy test practice in the application of *gurs* and knowledge of commercial arithmetic and a working knowledge of reading and writing should be considered sufficient.

Now I come to the second important factor in Adult Education, *viz.*, Literacy. As would be clear, the adult schools in a village are naturally of a temporary nature. As soon as a fairly large number of adults has secured the literacy certificate, the school will have to be shifted to another place where there is a demand for it. But the removal of the school leaves behind it the legacy of another problem, *viz.*, the danger of relapse into illiteracy and a desire in some for the development of the knowledge they have gained and for the nourishment and consolation that reading brings. It is in consequence essential that libraries should follow the adult schools. No scheme of adult education in fact can be complete without libraries. Accordingly the Department has instituted such libraries in connection with all Full Middle and Lower Middle Schools. There is, of course, some diversity of opinion about the selection of books of these libraries.

Some think that utility should precede culture and that selection should be on scientific and technical rather than on liberal lines. There is another school that would place only books like *Hir Ranjah* or novels like Sharar's *Firdausi Barin*, in these libraries. I personally should advocate an admixture of the two. Besides popular story books, I should place in these libraries stimulating and interesting pamphlets and periodicals on subjects like sericulture, gardening, poultry, farming, first aid, dairy farming and the like. The library might even include literature on such technical topics as pottery, soap-making, carpentry, crude oil engines, tanning, etc. A few illustrated books or magazines of Arts, especially Indian Art, will lend a cultural tone to the studies of the adult. In any case, the annual grant for the purpose being very limited, very great care should be exercised in this matter of selection. I personally should be strongly in favour of the compilation of a standard catalogue by the Department.

Incidentally, I might mention that all gifts of books for libraries, unless the books are included in the standard catalogue above mentioned, should be declined with thanks. I have frequently seen such gifts in some of the old school libraries and perhaps they are largely responsible for the absence of voluntary reading on the part of both pupils and teachers. These books are usually of no interest, gifts of private individuals, chiefly of old boys, tokens of a casual or a forced generosity, bad pamphlets, wordy treatises, all impossible to read. These sweepings fill the shelves, making the use of the library difficult, wearying the librarian and the reader alike. A popular library must be just the reverse. It must be agreeable to the taste of the average reader in the village, in other words, no book should be admitted which has not been carefully selected with due responsibility by some one. It may also seem to be desirable to give the users of the library a certain right of initiative, allowing them to suggest books for purchase. If the purchase of books chosen by readers is impossible or undesirable the D. I's or A. D. I's might, when visiting the library, make a note to this effect in the *Reader's Suggestion Book*. As regards the library service, I would suggest that, in the first instance, the catalogue system for all village libraries should be uniform.

The library should be open every week day for two or three hours, the exact time being fixed in consultation with the readers.

Books may be issued on loan for one week, but a book may be renewed for a further week, if no other reader has asked for it. Newspapers, journals, picture-books and books of reference, if there be any, should never be allowed to leave the Reading Room.

The librarian should take steps to ensure the efficient handling of books, their issue, return and rebinding when necessary. I have, of course, presumed that all books placed in libraries shall be bound.

It must not be forgotten that it is desirable to emphasise the missionary quality of the work and that the village library like the village adult school may be regarded as an instrument of social service.

The work of the librarian is perhaps not so easy and simple as at first sight might appear. I would therefore suggest that the courses of study at our training schools might include library administration and routine. The training in this direction should be more practical than theoretical. I should make every J. V., or S. V. student look after and administer first of all the school library and then the library in the adjacent village for a month or so and only such as prove efficient in the handling of the library might be recommended by the headmaster for employment as librarians. I cannot leave this important subject without saying a word about the library room. The ideal would be that the library may have a separate building, specially designed and constructed for the purpose. Besides the public reading room, it might have special reading room for children, a small museum, and a hall for public or social meetings. Such a building need not be very large. It may be small and modest, constructed as economically as possible. But it should have its own clean bright rooms suitably decorated, with a touch of fancy, and have agreeable exteriors. If possible it may stand clear of other building and surrounded by only the pure air and the green country. It should moreover have a whole-time librarian of the same status as a senior vernacular teacher; and should be open from sunrise to sunset. One of Mr. Brayne's village guides could be very useful in this capacity. This is, of course, an ideal, impossible of attainment at the present stage. So we have to be content with a room in the school building. There should be no dubious shame-faced accommodation in a corner of the verandah or the water room. The library should be housed in one of the best and brightest rooms of the school building. It should be tastefully decorated with good specimens of calligraphy and pictures mounted on cardboard, and fitted with benches, an almirah or two and a good hanging lamp. It should moreover be exclusively used as the library room. We have hitherto tried to induce village philanthropists to put up school buildings. Let us now try to persuade them to provide rooms for libraries and at least furnish them.

Gentlemen, I have not only exhausted my time but, am afraid, have also exhausted your patience. I would therefore conclude with the request that you all who have assembled here to-day may so thrash out this problem as to show us a way whereby we may be enabled to banish illiteracy from our province and may thus ultimately make our adult schools the homes wherefrom may be produced for the good of the community and the country enlightened citizens, educated fathers, intelligent artisans and efficient labourers. History proves that ignorance

is a menace to Government and a means of danger to society. The ignorant are conservative, suspicious of reforms and reckless in times of revolution. Ignorance is the author of limited and narrow views and the father of prejudices—national as well as religious. Our ultimate objective, of course, is the second stage of our efforts which probably will remain unaccomplished for not a few years to come but at present, as I have already reiterated *ad nauseam*, we are faced with the demon of illiteracy. Next we have to fight the giant of ignorance. Vast treasures, gentlemen of thought, feeling, aspiration and noble sentiments exist among our illiterate brethren quite unknown to you or to me and these have never been called forth for lack of opportunities. I cannot fully estimate how much has been lost to mankind through illiteracy which hinders free development of man's best nature. Let us, therefore, stay the tide of ignorance. Let us set the wheels of education in motion which will surely spread life, light and joy all round and throughout the length and breadth of this our motherland.

PRESIDENTIAL ADDRESS TO THE SCIENCE AND GEOGRAPHY SECTION.

THE VALUE OF EXPERIMENTATION.

BY PROFESSOR H. B. DUNNICLIFF, M.A., Sc. D., F.I.C.,
Punjab University Professor of Inorganic Chemistry.

"EXPERIMENT IS THE INTERPRETER OF NATURE."

Though conscious of the compliment which was paid to me when I was invited to be President of the Science and Geography Section of this Congress I did not accept it at once, as I felt that there might be others better fitted by long experience and intimate association with school teaching in India to do justice to the task. Since I have accepted this honour and lest I may seem to be a usurper of another man's rights, I beg leave to consolidate my position by presenting my credentials. The subject matter of my address is based on twenty years' practical teaching during which I have had actual experience in a number of English Public Schools, such as Wellington, Cheltenham and Rugby and also in several High Schools in England and in India. At one time I was on the staff of Cambridge University and at another I was private Tutor to a Raja. In fact I think I have at some time or other done every grade of teaching from that of a University Professor to that of an instructor in a private cramming academy. In addition to teaching appointments it has been my lot to work for several years as a Works Chemist—an exacting position in which one is judged by actual results not by a first class degree taken half a generation ago or by the letters after one's name or similar fancy trimmings.

The duties of a technical chemist involve the employment of science in its most useful function—the practical application of knowledge to a commercial process for the common good. It is thus perhaps possible for me to lay claim to have had a wider range of experience that has fallen to the lot of many teachers, though I do not doubt that some can boast of more years of service in the profession.

Hence the views which will be expressed are those of one who realises your difficulties by actual contact with them and who wishes by criticism and advice to try and do this part in showing where, in his opinion, defects lie and in making suggestions for improvement in the future.

The subject of my address is the value of experimentation.

In general terms, all men are born with one intuitive power in common—the creative instinct. By “intuitive” I mean something integral and personal to themselves and over which, in the first instance at any rate, they have no control. The ultimate object of this instinct in its highest form is the perpetuation of the species. In the child this unconscious purposeful action manifests itself in the subconscious or involuntary desire to do something with his own hands. The natural consequence of this is the intentional or cultivated development of manipulative skill. How constantly has one to correct a small child for touching objects which he may damage or which may damage him. This passion for handling things is noticeable from babyhood upwards and gives the teacher of a practical subject an immediate advantage over teachers of such subjects as history, languages, etc. This is because the natural propensity of mankind is to do something of an active rather than of a sedentary nature and it is essential that any satisfactory scheme for the teaching of science must involve the development of this instinct so that it runs along orderly and productive lines. The main point to be emphasised is that the inclination to do things is there and requires development. This natural craving which is so marked in most of us from our earliest day may be satisfied in the school curriculum by nature study and by the careful development not only of the child's powers of observation but of the ability to make simple deductions from these observations. Large amounts of apparatus are not necessary. Such articles as may be found in any house garden or stable may be used and the medium of expression in which articles, experiments or observations are described may be a vernacular or, for the matter of that, a village dialect. The question of the teaching of Nature Study in Schools will be discussed by Professor Matthai, but my idea is possibly even simpler than that usually understood by the title of his paper. A very elementary example will suffice and it will be seen that the elixir of scientific life I advocate is observation and deduction from simple experiments performed by the

pupils themselves. Let boys plant 20—40 seeds of the same kind in pots or in the ground and let them take up, after each day's growth, one seed and make notes on what they see, *e.g.*, the bursting of the seed ; that part of the plant grows down and is white, and part grows up into the air and is green ; that the exclusion of light by putting a tin over one seedling for a few days makes it lose its green colour, and so on. It is astonishing how little an untrained mind actually notices. These simple experiments and the description of them written in the open air and with the living examples in front of the boys will give them practice in language, a healthy occupation and the basis of a scientific training. Many simple experiments for which no expensive apparatus is required may be devised by a good teacher and it will be found that the children readily take a lively interest in their work.

The key note and basis of scientific training is experimentation. But experiment is only the beginning. The record of facts obtained by experiment and observation by themselves are empirical knowledge. The word "empirical" means "experienced" but empirical knowledge is the term applied to chance experiences, which occur without any orderly plan of investigation. History teaches us that the commencement of any branch of science is nothing more than a series of experiments and observations which have no obvious connection with each other (Liebig 1846). In order that the facts obtained by experiment may be used for the furtherance of our exact knowledge, they must be understood and analysed according to some conceptions which, applied for this purpose, give distinct and definite results such as can be steadily taken hold of and reasoned from (Whewell). Huxley asserted that all true science must begin with empirical knowledge—(that is, where the child's "handling" comes in)—and that this empirical knowledge must be followed by analysis and reasoning. The guidance along these lines is where the teacher takes his part.

It is clear then that, from the earliest times, our great men have emphasised the fundamental importance of practical work. Experimentation is not necessarily synonymous with heavy expense. A limited amount of apparatus is necessary for any organised science course and the adaptation and application of that apparatus to a number of different experiments involves thought, patience and ingenuity. Too much equipment ready to hand is not an asset to the elementary student since it tends to inhibit the cultivation of that resourcefulness which shows itself in the adaptation of available material to new requirements—a faculty which should be well developed in any good chemist or physicist. In this respect, Chemistry becomes, in certain of its phases, an art. For what is art but the modification of available resources to make them serve a given object. Mills defines "art" as the employment of the powers of nature for an end,

and it is to be emphasised that “it is the *employment* which is the art—that use of the natural elements for our own purpose is precisely that function of the intelligence and the will which differs from nature in its proper sense as the active differs from the passive.” I wish the subject in our Matriculation and School Leaving Certificate was called “General Elementary Science” because this title would force on the attention of the beginner how various lines of scientific study have a tendency to become interlaced.

For example, the interdependence of Chemistry and Physics has become so complete as to result in the birth of a new branch of Natural Philosophy called Physical Chemistry in which mathematics also plays an essential part.

It was hoped when a research problem was introduced as an obligatory part of the qualification for the Degree of Master of Science in Chemistry that, having once tasted the joys of individual investigation, the character of our men would be strengthened in such qualities as perseverance, attention to detail, observation and invention. I fear that my experience has not seen that hope realised. Only one of my old pupils who has taken the M. Sc. and returned after joining a teaching department has made any conscientious effort at further research, but many have come back saying what difficulties they had with their routine work and the impossibility of research. They never seem to realise that their daily difficulties create the problem for research—an investigation into how to adapt local conditions to the curriculum they have to teach. Research with them seems only to mean some abstruse academic problem capable of being carried out with expensive apparatus and endless facilities—to say nothing of the constant guidance of a greater mind.

While experiment and its natural consequences are imperative all through a scientific training, the main object in the earliest stage should be to sharpen the children’s wits—not give them a lot of difficult new words to learn—and to cultivate their ability to express mental ideas describe everyday objects or actions in simple language. They should be followed by an attempt to correlate or make simple deductions from the observed facts. A more systematised course of study should be taken up in the Matriculation classes, but it is essential that the syllabus and method of instruction should follow on naturally from that given to the middle classes and be dependent on it. In the next stage, when studying for the Intermediate examination, the subjects would be still further developed but again consequent on those taken up in the Matric. course.

Nowadays it is often found that boys who have not read Science for the S. L. C. or Matric. Examination take up the F. Sc. course. In my opinion this is wrong and should be impossible not by prohibition but by making science compulsory in the Matriculation. In fact I am in favour of all classes of the subjects,

being compulsory for the Matriculation though variety should be permitted in the selection of a language or a vernacular. The five compulsory subjects would be :—English, Arithmetic and Algebra, History and Geography, General Elementary Science and a Language. Every child should have some training in elementary scientific principles—and this requires good teachers. The standard of knowledge of the average matriculate who took science is very low in spite of a reasonable course of study and a well-designed syllabus. This poor quality of science in the Matriculation is due to two causes :—

- (i) indifferent teachers and
- (ii) inadequate equipment.

Schools claim to teach science though they have no specially qualified science teacher and their almirahs contain insufficient apparatus to satisfy even the moderate demands of a District Inspector. To one who looks carefully into the procedure in such schools, it is obvious that the boys seldom, if ever, handle apparatus and that they learn their science entirely from text-books or by theoretical class teaching. Not even articles easily obtainable in any bazar or capable of local manufacture are to be seen in many schools though the existence of manual training classes in a certain number of institutions is partially mitigating this omission. It is noticeable, however, that these classes are usually found in schools where the science equipment is, at any rate, moderately good. Such badly equipped schools should either put their affairs in better order or the University should refuse to accept students from them as candidates in science. I strongly recommend that the reports of the Inspecting Staff should have to include an answer to some such question as "Is the school equipped with sufficient material to teach the boys practical science to the standard of examinations for which candidates are sent up?" Very little so-called "apparatus" in the catalogue sense is required for middle schools and I hope that in his paper L. Rattan Lal will dwell on the vast amount of work that can be done with primitive ready-to-hand objects. I maintain that in these classes it is certainly not too early in a boy's life for his inventive propensities to be looked into and their development fostered. Even earlier some would say, for the popular interest of tiny children in plasticine models, moulding simple objects out of clay or the building of Meccano toys indicates the beginning of that desire to use the hands which is born in every human being but which, for want of careful nursing, is so often allowed to decay. We hear much of and applaud the "Play-for-all" movement. It seems to me that the kind of study of the laws of nature described above might well be included in the title, for play not only means physical exercise giving bodily enjoyment but also implies mental exercise which rests and refreshes the mind. As Emerson says :—"The plays of children are nonsense but very educative nonsense."

As the range of study gets broader, the necessity for laboratory equipment which is indispensable for the proper study of any scientific subject progressively increases both in quantity and intrinsic value but it is self-evident that much of the material (*e. g.*, inclined planes, geometrical models like spheres, cubes, test tube and funnel stands, tripod stand) could be made in the neighbourhood of every school by mistris, etc., encouraged by the staff or even by the staff themselves perferably with the assistance of the students. At present the initial Government grant for Physical and Chemical Equipment in an Intermediate College is about Rs. 15,000 for double sections in the 1st and 2nd year. Intermediate classes (together with the preceding Matriculation classes) and though the list has been compiled with the assistance of experienced collaborators, I know, that, were individual effort made, schemes for the reduction of the cost of many items could be put forward. I submit that many of our teachers are too unimaginative and that very few of their number cast about for such methods of improvement. As I said before, they seem to regard RESEARCH (in capital letters) as something demanding the existence of a large town, a fine laboratory, expensive material, the assistance of a well-qualified and experienced professorial staff and finally the publication of a paper in a Scientific Journal. I feel, that we, the higher teachers, are partly to blame for this. The incorporation of a thesis as an essential for the M. Sc. degree is ideal but I fear that many of our pupils leave the University having done good work as assistants, but having acquired scarcely any of the originality and resources which their research work should have taught them.

I think that perhaps we do not teach our pupils to be sufficiently self-reliant nor to use in a practical manner and adapt to different conditions what they learn under our guidance. They go with a very restricted idea of what the word "Research" means. I venture to quote from my own work an example of what I mean. It has been my privilege to be the author or joint author of many published papers but I always consider that, in many ways, the best piece of original work I have ever done is embodied in a little work called "Laboratory Glassware Economy", a part of the preface of which I will read to you as it is an instance of the point I wish to make.

"Since the commencement of the war, very little glassware has been received at the Khalsa College and no new consignment has arrived for more than fifteen months."

"I was faced with an increase in the number of students and the demand for glassware was keenly felt. For these reasons I set to work to carry out what had been my intention for some years—to seek for easy methods of removing and adapting to new uses, damaged apparatus made of glass.

We commenced with simple repairs, and, encouraged by success my Senior Demonstrator, and my second laboratory

assistant started to search in the waste box for any broken glass which could be adapted to useful purposes.

“ By their industry and application in this branch of laboratory work my two colleagues have enabled the Science classes to continue their regular practical work under abnormal conditions.

“ What has been done by one can be done by others, and I have put these notes together in the hope that they may be helpful to those experiencing difficulties similar to my own.”

I do not think that any really conscientious effort is being made in our schools or colleges to practise that sort of economy—even in the exercises which do not require a gas installation.

The subject which demands careful thought is that if the correct spirit had been developed in our pupils who eventually become teachers we should find that, when faced with a difficulty, they would discover a way out. In many cases I find that the response to the difficulty is mere inability to proceed. One man could not get distilled water and so wanted a grant for an expensive still. Though in my own laboratory he had seen my not very successful efforts to solve this distilled water question, always a vexed one in Lahore, by means of a kettle and an oil stove plant, he made no effort to improve on my idea by using a larger kettle with a broader based shallow bottom (capable of being made by the local tin-smith) and a charcoal fire. How pleasing it would have been if he had come back and claimed success where I had failed. Another man found difficulty in getting water on to the roof of his laboratory. There was a pump but it no longer worked. When I asked him how the pump operated he did not know its mechanism ! He was a pupil of mine and had actually seen my practical way of solving motor car difficulties by getting down to the job myself but his only remedy was to apply to the Sanitary Department. I could not help wondering why some system of small buckets in a continuous chain in several stages if necessary—had not been tried to solve the difficulty. In the days of Akbar water was raised by mechanical means to considerable heights. With all our vaunted progress and development, are we going to confess to our inferiority to the men of those times ?

Both of the men to whom I have referred told me that there was no “ atmosphere for Research ” in their Colleges. Could they not realise that to attempt the solution of these very difficulties was their problem for research ready to hand ?

If teachers have so little enterprise, can we be surprised that their pupils are unimaginative and lacking in resources ? Too much apparatus of a higher efficient kind is, in my opinion, a positive handicap to research men in their early problems. Difficulties are the correct spur to individual effort in the right type of men. Yet these men we have trained, who have really worked

hard are so often like—

“ An infant crying in the night,
An infant crying for the light,
And with no language but a cry.”

Tennyson.

We want to improve on this crying business and get them to seek for the light and not succumb helplessly to adverse conditions. So long as our pupils fail to satisfy this test of practical application of their laboratory and book work I maintain that we who train them have failed in our object.

Another difficulty I have constantly to face is the low order of the power of observation in many men I know, even among those who have got Master's degrees in science subjects. The other day I was talking to a Chemistry M.Sc. of two years' standing who did not know where cement is manufactured in the Punjab or where there is a lime kiln near Lahore and who after practical acquaintance extending over nearly eight years thought coal gas is used in the Government College and other laboratories! It is all most disheartening. But perhaps, as I have said, it is the fault of those who teach the teachers in the first instance and people like myself are reaping what we have sown. I regret to say, however, that I feel that we are at present suffering from a number of teachers whose only thought when they go into a class is how soon they can get out of it. Possibly this is because teachers are largely recruited from those who do not succeed in getting other employment and so fall back on school work as a means of livelihood. Only recently I have heard that a man who obtained his M.Sc. after eight years' study is likely to leave the teaching of science to take up a clerical appointment and that after receiving selective promotion. He could not have been keen on his subject and it is bad for boys to get the impression that they are being taught by men who only do such work because they cannot get a better post or who only use the profession of education as a stop-gap till something better crops up. The ordinary plan of attack of a Chemistry M.Sc. on the problem of future existence and subsistence is first to go collecting chits in pursuit of *direct appointment* as an Extra Assistant Commissioner. That is the most popular having the optimum financial prospects. If unsuccessful the Income-Tax Department receives hopeful attention, than Railway clerical appointments. After that the police or other non-scientific avenues to future domestic stabilisation. Finally, when all else, even the search for a business appointment has yielded no result the soldier in the battle of life asks for a recommendation to the Director of Public Instruction for a teacher's post in an Intermediate College or as a schoolmaster or District Inspector in the Education Department.

Having wedded themselves to science many flirt with the law and after this exhibition of inconstancy, they expect us to say that they are the finest characters to whom to entrust the

education of the youth of the Province. I find that there is a marked tendency to secure an appointment in a school or college and then sit back and complain because the pay is not higher. With many there seems to be little idea of justifying the payment of even the moderate salary they receive and no ambition to merit a rise by excellence of results.

Some time ago I was told by a highly placed officer to go into a school which was considered very good by the Department. I was permitted to ask any questions and make any examination. I found the equipment good and though the space was cramped there were excellent facilities for experimental work. I was most distressed when I looked at the student's note books which, though very neat, were full of mistakes, mainly in spelling. I asked the teacher why he did not correct such blunders, one of which occurred unmarked in three successive lessons. He replied that it was not his work to correct spelling errors, that being the duty of the English teacher, and that if it were, he would have to do it out of school hours. Did any one ever hear of a conscientious schoolmaster who did not have to revise note books and exercises after the boys had gone out to play games? Then comes the usual monotonous lament about insufficient pay and inadequacy of prospects. In my opinion that complainant was *over* paid not because his salary was high but because he was dear at any price. I think that there is insufficient appreciation in many members of our branch of the profession of their sacred trust and wonderful opportunities. One rarely hears of teachers devising new experimental methods or, if their apparatus is poor, scheming out simple ways of improving the efficiency of their inadequate equipment. Most teachers are willing slaves of a mass of indifferent text-books and the methods given in them. Boys are seldom taught to use their powers of observation and the literature placed before them is full of errors in spelling, language and procedure. It is perfectly obvious that many authors have never carried out the elementary experiments they describe.

Some little time ago I was asked to revise the manuscript of a Matriculation book for the press. Out of curiosity, I examined the text at some length. The work was full of blunders in English, such as :—

“Take an iron piece.” “A man jumps longer when he runs through a distance,” the constant misuse of the articles “a” and “the” and of such words as “shall” and “will” When refusing the work I had to point out that, if I took it on the entire time I could devote to it would be spent in correcting the language—and yet I expect that that book is now published and doing a roaring trade to the monetary advantage of the perpetrator and the mental harm of the reader. Dr. and Mrs. Whitehouse have just published a book on the “Assignment System.” I saw some of the manuscript in preparation and know the infinite pains taken over the work. When I saw it on the stall yesterday published at I think Rs. 2-8-0, I remarked

to the agent, "How long do you think it will be before an eight-anna garbled version of this book is on the market?" and read, sad to say, in preference to the original helpful work.

If it were suggested that those in charge of children wilfully injured their bodies, not only charitable societies but Government itself would be up in arms and yet we allow the free circulation in our schools of these cheap and nasty books which harm the intellects of those it is our prime duty to protect—the coming generation. Their youthful minds become filled with inexactitudes which it is not possible to eradicate even if the boys grow up to man's estate and take the Master's degree.

You may feel that I speak strongly—I feel strongly and I am asked to say what I feel and I confess to a sense of keen disappointment in the small mental development in science of the boys who come up to me from the schools. We have in the College to do the work the school should have done for us. It is hard to be disappointed but harder still when one feels that the disappointment is avoidable. It is possible for all science teachers to do their bit. Do not allow bad books, do not allow slovenly work, show the example by taking the trouble to let each individual boy see that he has your personal notice and consideration.

There is not the least difficulty in making boys interested. They easily become keen *IF* they have experimental work to do and particularly if they are allowed to progress according to their ability and not at a rate measured by that of the slowest boy. Boys and girls love doing things with their own hands. If any of you has seen a class—say a middle school class—let loose with a thermometer and witnessed the children's hectic delight in watching the mercury rise and fall as the instrument is heated or cooled will know the enormous pull a science teacher should have over an "arts man" who has no such fascinating toys to attract his pupils.

The blame for another evil lies at the door of the University Syndicate who freely grant affiliation in science for a certain advance date "provided that equipment is obtained" by that time. I maintain that no affiliation should be granted *until the equipment is received and inspected*. Only this month I was to have inspected a College to see if its equipment is adequate. The Committee asked for the inspection to be postponed because things were not ready owing to some local disturbances. Another Intermediate College has been teaching science since May and neither gas plant nor laboratories are yet ready. I am expecting to find that boys were admitted last June expecting to do practical work and, according to the reports from the place itself, they cannot have started properly yet.

It may appear that my main theme is one of dissatisfaction. I really feel that there is cause for this. The Punjab Government is doing its best to improve buildings and equipment

but I have no reason to feel that the average boy who comes from a Matriculation class knows much about elementary science. But the possibility of improvement is in us all and I feel that we in the field of higher instruction in science must turn our attention more to everyday problems and to imparting the method of attacking them to our pupils. I suggest that teachers on their side can do much by encouraging—

(a) The boys to observe exactly and closely simple phenomena and to insist on the submission of careful reports correct in both the language and spelling. This involves the conscientious revision of each exercise book after each lesson, not mere intialling.

(b) The use of simple apparatus and the piecing of it together to do the experiment they are assigned.

(c) To invent new ways of showing familiar phenomena.

(d) To foster diligence by allowing a boy to proceed as quickly as his ability permits him.

(e) To encourage the boys to be self-reliant by getting out, cleaning and putting away their own apparatus and pointing out that, if in the process their hands get dirty they are in no wise the worse for it since soap and water are both available and cheap.

The value of such principles will be expanded at greater length by Mr. Wilsdon, who will address you on "The Influence of Elementary Science Teaching on the Development of an Orderly Mind." Dr. Whitehouse and L. Sohan Lal Khosla will explain the method of individual instruction and the scheme by which boys may go forward at a rate commensurate with their personal equation of ability. With the general advance of education in this province other problems are coming more and more to the front and we shall look forward to hearing Miss Harrison discuss the difficulties peculiar to the teaching of science to purdah women and L. Lachhman Das on the all-important subject of the teaching of agriculture to the youth of the Punjab at an early stage in their school life.

At this Conference papers will also be read on Geography—the science which teaches us about the earth's surface as it now exists—a very different task from that of the geologist who seeks to throw light on the past history of the globe, although in so doing he must constantly refer to its present conditions. The inclusion of Geography as a subject in a school curriculum will be justified by L. Atma Ram and its importance as a subject for primary education by S. Balwant Singh. Geography deals not only with the localities of lands and seas, and hills and lakes, towns and cities, pasture lands and deserts but also embraces the study of the distribution on its surface of the various products, its people, its fauna or animal life, its flora or plant and forest life and its products of every kind. Geography has been much neglected in this Province in the past and it is good news that such

an omission is to be rectified though I understand that qualified teachers are very hard to find.

The subject is a vast one and embraces many comprehensive subjects among which I may attempt to define one or two as I feel that many of my audience may not have a correct idea of the possible ramifications of this subject.

Descriptive Geography is that part of the science which involves only a statement of facts. The analysis, comparison, and reasoning on these facts constitutes the domain of Physical Geography or Physiography.

Political and Historical Geography deals with the division of the earth's surface among the different tribes, people and governments. *Political Geography* in its simplest form is the study of the present state of things in that respect while historical geography investigates and records the changes in the Government control of territory which have occurred from time to time. This branch of science is, in fact, history from a geographical point of view or that kind of history which, to be made intelligible, requires the aid of maps.

The different aspects of the Botanical Geography of the Punjab is the subject chosen by Mr. Blascheck and L. Mohan Lal Sethi for their papers, while a wider field under the same head is to be dealt with under the title of "The Possibilities of Plantation Agriculture in India" by Mr. Bannerji.

My theme has been the value of experimental work, properly supervised by individual attention both in class and in the correction of written notes. Further effort must be made by instructors to evolve new ideas and to invent methods for solving the practical difficulties associated with their own equipment or with the ekeing out of indifferent or scanty material. Endeavour to make your boys masters of practical demonstration, not the slaves of text-books. Rigidly exclude badly written literature from your class rooms and laboratories.

The more practical a science course, the better it is. Your work will be hard; the results often disappointing. But Rome was not built in a day and to achieve success requires self-sacrifice and devotion. The nearer to the practical men keep, the mightier their power. "The theorist who dreams a rainbow dream and calls his hypotheses true science at best is a paper financier who palms his specious promises for gold" (T. L. Harris). "Hypotheses are cradle songs by which the teacher lulls his pupils to sleep." (Goethe). So let us all conspire to put more originality into our lives in all its phases with the ultimate object of applying the useful results to our everyday difficulties. There is no greater mistake than to look superciliously on the practical applications of science. Many of the greatest advances in physics and chemistry have been made in the earnest desire to turn the properties of matter to some useful purpose for mankind.

“ Experiment is the interpreter of nature. The advantage of experimentation over the simple observation is universally recognised. It enables us to obtain innumerable combinations of circumstances which are not to be found in nature and to add to nature’s experiments a multitude of experiments of our own ” (J. S. Mill). Experiments never deceive. It is our judgment which sometimes deceives us because it expects results which practical investigation refuses. We MUST consult experiment, altering the conditions until we have deduced the rules which can only be discovered by systematic trial under varying circumstances. And with this must go deep and considered thought for—

“ Man’s work must ever end in failure
Unless it bear the stamp of mind.
The head must plan with care and thought
Before the hand can execute.” (*Schiller.*)

PRESIDENTIAL ADDRESS TO THE VERNACULAR LANGUAGES SECTION.

BY KHAN BAHADUR SIR ABDUL QADIR,

(*Barrister-at-Law.*)

THE STUDY OF VERNACULAR LANGUAGES.

I am very much obliged to the organisers of the Punjab Educational Conference for their kindness in asking me to preside over its Vernacular Languages Section. There have been many conferences before in Lahore under the auspices of the Punjab Education Department, but I do not think any one of them has been organised on such a scale or with so much regard to the details of education in its various branches. Among the subjects which are going to receive consideration the subject of vernacular languages is by no means less important than any other subject which may come before you for discussion, because a good knowledge of the vernacular is essential for educational progress in any country. In fact it would be no exaggeration to say that it is the very foundation on which the superstructure of higher education in arts or sciences can be built. It is somewhat unfortunate that this question presents more than ordinary difficulties in this country and is very complicated. Confining our attention to our province only, we find that there are no less than three languages in the Punjab which are classed as vernacular languages, namely, Urdu, Hindi and Punjabi. Urdu is taught in the largest number of schools and is studied by Hindus as well as Muslims. Hindi is studied in some schools by Hindus as an alternate language and Punjabi (written in Gurmukhi characters) by Sikhs. In most denominational institutions you find Mussalmans studying

Urdu, Hindus learning Hindi and Sikhs going in for Punjabi. I need hardly say that this state of things is far from desirable, and from a purely educational point of view it would be a great advantage if different sections of people in this province could resolve to adopt one of these three languages as a common medium of instruction and as the most favoured vehicle of literary thought. This should not necessarily mean a discontinuance of the study of one of the remaining two languages by those who have a desire to pursue its study on grounds of sentiment or utility, but this would certainly solve many of our most intricate educational problems, especially those concerning education in secondary schools. In the present circumstances, however, I do not propose to deal with the claims of any particular language for such preference, because from what I know of the temperament of our people in this province at present, there is no immediate prospect of their adoption of the desired course in this respect. I would therefore discuss the subject on the assumption that these three vernaculars are to remain in the field and to advance side by side. There has been considerable progress in the development of each of the three languages in the Punjab during recent years, and it is encouraging to notice that some of the best products of our University are beginning to devote their efforts to push forward this development ; but in spite of their remarkable activity much remains to be done. Urdu and Hindi have produced more literature than the Punjabi, and have added to their stock some valuable translations from English as well as from other European languages on Science, History, Politics and Philosophy. The Punjabi has yet to cover considerable ground to be on an equal footing with its more advanced sisters. Those interested in any of the three vernaculars should now consider how they can help their further growth, so as to enable the students of vernacular languages to derive a greater benefit from their studies than is done at present. I am afraid the study of vernaculars has been very much neglected hitherto, for one reason or another. In Primary schools all that can be done is that students learn reading and writing in the vernacular taught to them. When they begin to read the language with some facility, the teachers as well as the taught appear to think that much attention need not be paid to the vernacular. The result is that notwithstanding the progress that has been made in the production of readable or useful books in the vernacular, the standard of efficiency as to its knowledge has been getting lower and lower among students. Among those who take up the vernacular as a subject in their Matriculation Examination there are many who after having been supposed to study it for about 10 years can neither speak it correctly nor write it accurately. Those who had opportunities of examining the papers of candidates for the Matriculation Examination have told me that though a large number of students get through their examination by obtaining the necessary minimum of marks, the vast majority of them have a very

poor knowledge of the language. I have myself noticed, in examining the papers of students who offer Urdu as an optional subject in their Intermediate Examination, that their knowledge is generally defective. Among the reasons that have been conducive to this undesirable result is that in most institutions, there are no proper arrangements for teaching the vernaculars. The Department is now paying some attention to the providing of teachers for vernacular languages, but even now it is not often realised that it is necessary to secure as highly qualified and competent teachers for these languages as for other subjects. Another means of developing the vernacular is that measures for the special encouragement of their study be adopted. If you scan the list of scholarships or stipends awarded in various schools or by the University in various departments of collegiate education, you will notice that it is rather rare to find any scholarships or rewards for distinction in vernacular languages. There is a prevailing notion that these languages are very easy and that it does not require much hard work to obtain high marks in them. I do not think this view is correct. It is true that it is easy for every one to acquire a working knowledge of the language which he studies as his mother tongue or as the language of his country or province, but if mastery and perfection be aimed at, every language requires very hard and devoted study. Examinations in these languages could with advantage be made more searching than they are at present and the scope of studies in them could be very much enlarged and with these improvements there should be no reason why any one who achieves distinction in a vernacular language should not receive the same encouragement in the way of prizes and scholarships which is received by students excelling in other subjects. It is a sad commentary on the existing system of imparting education in vernacular languages that the majority of students cannot express themselves correctly or impressively in any language of their own country and very often speak and write correct English with greater ease.

Besides the measures suggested above for improving the study of vernacular by means of providing better teachers and giving special encouragement to those who distinguish themselves in such languages, there are no other suggestions that can be usefully made. The most important among them is the creation of healthy and useful literature. In this connection I have to confine my criticism to the Urdu language, because unfortunately I do not know Hindi and so far as Punjabi is concerned, I am not conversant with Gurmukhi script and am not familiar with what is being published in Gurmukhi. There have been of late plenty of new publications in Urdu and publishers are devoting greater attention than before to improving the get-up of books and are also spending considerable sums of money in inducing good writers to give the benefit of their labours to the public. This is quite hopeful, so far as it goes, but this is not enough. A large number of books are of ephemeral interest. A considerable portion of

them consists of works of fiction, which, with rare exceptions are of little value, either from a literary point of view or with regard to any possible utility. There are also a number of books of poetry but the majority of them are such as can be classed as poetry only in India. They are nothing more than repetitions of sentiments and thoughts, which some older masters have expressed with greater effect and in more beautiful words. The energy that is devoted to such words cannot but be regarded as so much energy lost, a waste which we can hardly afford at a time when our national requirements need all the effort that we can put forward. There are no doubt some poems which have the merit of originality or are written with a particular purpose and I have no quarrel with those few, but I have no hesitation in saying that a large mass of them do not mean any strength to the Urdu language or literature but are a source of weakness. The history of every language shows that in its beginning it develops good deal of poetry, but as it grows, poetry gradually gives place to prose and the real wealth or greatness of a language is judged in modern times, at any rate, by the wealth of its prose. It is in this direction that we need the best efforts of our best brains. We require first of all translations or adaptations of standard books on Physics, Chemistry, Sociology, Economics and Politics, as well as on other subjects commonly taught in schools such as History and Geography, so that these branches of learning may be within the reach of the ordinary Urdu-knowing reader, whether he is a student in an educational institution or a private individual wishing to add to the stock of his knowledge. When we have collected a sufficient store of such text-books in the vernacular, we can reasonably expect to have some original works on various subjects from the pens of those who have studied them through translation and adaptations. In works of fiction our present need is that the books written should not aim at merely furnishing amusement to their readers but should combine amusement with intellectual profit, like some of the best novels written in the English language, where the novelist influences contemporary thought on all important questions affecting the social, political and intellectual well-being of the nation.

The remarks I have made above about the proper development of Urdu literature would equally apply with necessary modifications, to Hindi and Punjabi, though I understand Hindi is not too much overburdened with useless poems. The preparation of suitable dictionaries and books of general information like encyclopædias, has been, I believe, undertaken by scholars of Hindi and I am glad to learn that efforts are being made to provide such books in Urdu as well and that one or two schemes are nearing completion. These additions to facilities for acquiring knowledge will be quite welcome and will, I hope, lend an impetus to the study of the vernaculars.

We should aim at the attainment of purity in the use of every language that we learn, whether it is our own or a foreign language. With regard to Urdu I have often noticed a tendency in the Punjab to pay comparatively little heed to the correctness of pronunciation or to elegance of style in speaking or writing. I would urge on all interested in furthering the cause of this language, the necessity of learning it carefully and of trying to get into touch with Delhi men and U. P. men, in order to cure their own defects and to remove certain characteristic provincialisms. It may also be pointed out that the habit of introducing too many foreign words in speech or writing, which commonly prevails among those of us who know English, is damaging the purity of our vernaculars very much. This is a fault which is to be found in common among students of Urdu, Hindi and Punjabi in our province and the sooner they begin to discriminate between those English words which have by common usage secured a prominent place in our languages and those which have not, the better it will be for all concerned.

I have thought it necessary to invite attention to the purity of language, because I feel that it is simply on account of lack of care in this respect, that the Punjab is not getting all the credit that it deserves for the work that it has done in developing Urdu literature. For some years past it has been recognised even in centres of Urdu like Delhi and Lucknow that so far as the bulk of literary production is concerned, the Punjab is doing more than any other province in India for Urdu literature. The largest number of newspapers and magazines published in Urdu are published in the Punjab and it produces more books of all kinds in Urdu than even the U. P. ; but all this effort is discounted by literary experts of Delhi and the U. P. on the ground that the works published in the Punjab do not excel in quality. This criticism cannot be accepted as correct without some reservation. My personal view is that if quality is to be judged by thought and substance, then the writings of scholars in the Punjab have more of it than similar productions of the neighbouring provinces ; but if quality is to be judged by the correctness of language and idiom the U. P. works naturally have precedence. The defect, however, is not one which is beyond the power of scholars in the Punjab to remedy. One means of effecting an improvement in this direction will be to get the writings revised by scholars from the U. P., whenever such help is available, but the better method would be for the writer in the Punjab to attain a more complete command of simple and idiomatic Urdu. I am sure they can do so if they devote sufficient attention to this matter and occasionally spend a holiday in Delhi or in any big town in the U. P. or cultivate acquaintance of scholars from those parts whom they can find in this province. Lahore is particularly fortunate in this matter and has always had a fair leaven of scholarly men from Delhi or the U. P. who are attracted to this great intellectual centre by its literary activities. Recently an institution known

as the Urdu Markaz has been started in Lahore with the object of furnishing all that is best in Urdu literature in the past, and of producing new literature which would be an acquisition to the existing treasure. A number of distinguished men from the U. P. have been attracted by this work and scholars in the Punjab who wish to profit by association with them have quite a good opportunity of doing so.

Before I conclude I wish to add a few words more. I have already observed that the development of the vernacular language is hampered by the fact that instead of there being one language to be learnt as a vernacular, there are as many as three in the field and there has been on some occasions unhealthy rivalry among the devotees of each, which is detrimental to the best interests of progress. As long as we cannot come to an agreement to adopt one vernacular language definitely as the means of literary expression, we should at least avoid anything like friction, and the admirers of each language should do all they can to help their comrades working in a field similar to their own. There is really no conflict between these languages. Urdu and Hindi differ from one another mainly in the script in which they are written and to some extent in the inter-mixture of Persian or Sanskrit words, otherwise in their structure as well as in their origin they have very much in common and so far as ordinary spoken language is concerned they are almost identical. I should like to see at least a number of Muslim students in every school learning Hindi script in addition to Urdu in order to be able to appreciate the beauties of Hindi thought and of imparting into Urdu some of the best sentiments of Hindi writers. Similarly I should like to have in those schools where Hindi may be exclusively taught a number of students going for the study of Urdu. As regards the Punjabi language there is really no conflict at all between Punjabi and Urdu. Everybody in this province ordinarily uses Punjabi at home and in the market, whether he is a Hindu or Muslim or Sikh, and all educated Punjabis desire that this language may become richer and they have as good a store of literature as the other two sister languages. The only point on which opinions differ is that a good many people think that Urdu should be kept in its present position so that the advantage gained by about half a century of work in the field of Urdu literature may not be lost. On the other hand some want to press the claims of Punjabi at the expense of Urdu. I am among those who adopt the *via media* and am in favour of helping the development of Punjabi, without sacrificing the work so far done for the progress of Urdu. From this point of view there should be no occasion for friction and all lovers of vernacular languages should be able to co-operate with one another and to help the country to attain eventually the common goal, by bringing more light to the people, no matter whether the light is produced by the use of country oil, by kerosine or by electricity.

PRESIDENTIAL ADDRESS TO THE RURAL EDUCATION SECTION.

BY REV. A. E. HARPER, M.A., B.D.,

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RURAL EDUCATION.

Rural education in the Punjab is not a subject about which to be pessimistic. Whether one reads reports, or does the more courageous thing, looks up some of the work itself, one cannot help recognizing that there have been tremendous developments in the last few years, due to the foresight of our present Director of Public Instruction, Sir George Anderson, and his remarkable ability to carry his staff enthusiastically with him in the carrying out of the programme of development. No less fortunate is the Punjab in its Governor. His Excellency has shown in many ways his keen interest in the schools, an interest founded on real knowledge of the facts of education in the Punjab, and active participation in the forward plans.

Let us look at a few of these encouraging facts that have a relation to rural education. The doubling within 5 years of the total number enrolled in our educational institutions is most significant. The gradual expansion of the practice of compulsory education is bringing in a new day for the removal of literacy in the Punjab. At the time the last report was issued, 400 rural areas had asked to have this act of voluntary compulsion applied in their area. The development of a large number of primary into lower middle schools indicates healthy growth in rural areas. We are all acquainted with the assistance the village schools have given to the Co-operative Movement, in furnishing centres for these societies. It is interesting now to note how these societies are assisting the cause of education. Many are now requiring attendance in the primary school for the children of their members.

The wider conception of the function of the village school challenges the attention of any person who has watched the growth of education in the Punjab within the past few years. The idea has taken root that the village school should be a place of interest and activity with influences radiating from it to all the people of the village. In a number of the districts community service is being undertaken by the educational forces. School Inspectors give illustrated lectures at the school on health, agriculture and general matters of interest. The rural school has a function in the maintenance of literacy which, as the Director has said, "should never be allowed to go to rust." So in a large number of middle schools rural libraries are to be found. In Ferozepur District we have them in 20 upper middle schools, and in 16 lower middle schools. Other Districts have made like progress. The

books and newspapers are carefully selected to interest the adult reader. I understand that the Department of Education is having prepared special booklets on various subjects upon which the villagers should be informed, as co-operation, improvement of farming methods, etc. Such booklets can be read by the literate or read out to the illiterate by the school teacher. Over 60,000 adults are enrolled in night schools in a special movement for the education of adults. An increasing number of vernacular schools have small farms attached. 27 such were reported in the last published report, and 12 of these actually worked at a profit. The Director told us yesterday that these farms are now greatly increased in number. Mention must also be made of the extension of the Play-for-all Movement and the Food-for-all Movement into the village school. The Boy Scout Movement is finding its place also there and we may look forward to the development of the Junior Red Cross in the rural schools.

There has grown up also a new realization of the necessity of special training for the rural school teacher. It is recognised that village schools are doomed to failure if they do not have teachers who are trained to fit into the village environment. Too many teachers who serve in the rural schools are entirely out of sympathy with village life and interests. Their outlook is too narrow. They have no vision of the possibilities before their pupils. They have no knowledge of modern efficient methods of teaching. The remedy for all this must be applied in the normal schools and training classes. The department has recognized this and has taken steps leading to the improvement of training for village teachers. Mr. Sanderson's notes on this subject have led to a strong emphasis being placed upon the ruralization of normal schools and training classes for village teachers, as a preliminary to the improvement of instruction in the village school.

Many of us have watched with interest the step taken by the Department in drawing upon the inspecting staff for headmasters of normal schools for village teachers. Such men as Lala Hardyal Chopra and Sardar Sohan Singh have brought to the training schools their practical experience in supervising rural schools and their dissatisfaction with conditions in the schools. The Department of Education has encouraged and supported some experiments along the line of ruralizing the training schools, notably at Gakkhar, Lala Musa, Gurgaon, Moga and Jullundur. Reports of the work of these schools will be heard in the sectional meeting on Rural Education later in this Conference. Many of the papers of this section will be reports of actual work done and should prove a stimulus and inspiration to us all. I have not had the privilege of visiting the Gurgaon School of Rural Economy, but from reports of its activities we can learn much of what is being done there that could with profit be extended to other schools. The school work is being made practical, by bringing

to the school representatives of various departments of Government to tell the student teachers of their work, and how the village teacher can co-operate in it. The students go out to surrounding villages and conduct community work. They have taken over the management of such of their school and boarding life. Practical farm work and gardening is carried on. At Lala Musa the students maintain a night school, reading room and a small dispensary. They have also taken over responsibility for the general cleanliness of the buildings and compound. They have agricultural plots and make some articles for school use. The Government Normal School at Moga organised and carried through a programme of community work with sanitary, medical and nursing bureaus, and conducted a school for adults in town. The pupils also organised student government and took over the food arrangements of the school. A Co-operative Society run by students supplied most of the needs of the school. Project work was carried on through the building of miniature village in which the pupils of the practising school co-operated as well as Normal School pupils. Of these institutions, probably the most extensive reorganization was effected at Gakkhar. The school was fortunate in having land and buildings available for its ruralization programme, and in being situated at a distance from a city or a large town. The students engage in regularly organised work, learn various village trades, make many of the articles needed from time to time in the school life, cook their own food, carry their own water and clean up their compound. All these activities serve to give the boys a healthy respect for labour and the labourer, and develop in them manliness and an ability to handle any situation that may arise in ordinary life. Projects are in course of development in various classes and new methods are taught in the Normal school course.

So much for a brief description of the encouraging progress that has been made. Let us now turn our attention to the future. What is the next step to be taken? The problems of rural education are complex and involved. No simple formula can be proposed for their solution. But I venture to suggest that training rural teachers in improved methods of instruction is now a practical step forward. I presume I should not have been given the honour of presenting a paper before this distinguished body if it had not been for the fact that I have the privilege of being associated with a unique experiment in a complete revision of the rural school curriculum and methods of instruction, and the training of rural teachers along these lines. The Rural Community School at Moga, with its training class for village teachers, was founded by the Rev. R. H. Carter with the purpose of training a new type of leadership of the village Christian community. The thorough-going experiment in the revision of the curriculum and improvement of teaching method was initiated by Mr. W. J. McKee, whose contribution to rural education in India is universally

recognized. Moga is frankly an experimental school. We do not claim to have discovered a panacea for the ailments of rural education. We are only earnestly seeking to be of service and to work hand in hand with you in the common task.

This task of the future—at least the part of it in which our experiment at Moga is chiefly concerned—is that to which His Excellency referred at the opening of this Conference when he said, “that the need of the day lay not merely in the expansion of education but even more in the vitalization of education.” The Director has also reminded us that the object of compulsion is not increased enrolment but reduction of illiteracy. If this object is to be attained, along with progress in the application of compulsion should go definite improvement in teaching. A curriculum and methods which hold the interest of children and teach them economically and effectively, will make for the vitalizing of education even without the application of compulsion and, if supported by compulsion, will make for greater efficiency. A very interesting experiment along this line was tried in a backward rural community in America. The County Superintendent selected two rural schools situated in different communities but as nearly equal in ability and interest as possible. One he arranged to have taught according to the best practice prevailing in the public schools of that state. The other was conducted as an experiment school with a curriculum based on pupil interest and pupil purposing. After a four years’ experiment these were some of the proved results :

1. Pupils attending every day—Experimental School 93% ; Traditional School 5%.
2. Decrease in school tardiness—Experimental School 92% ; Traditional School 6%.
3. Pupils attending school throughout the term—Experimental School 76% ; Traditional School 2%.
4. Pupils graduating from the 8th Grade—Experimental School 85% ; Traditional School 10%.
5. English Grade graduates entering High School—Experimental School 85% ; Traditional School 8%.

In both of these schools, of course, compulsory education was in force. Yet notice the difference in the efficiency of the two schools. My point is that in the case of particular schools and particular areas, we should not wait for compulsion, nor consider compulsion the sovereign remedy. Teaching must be improved also.

This improvement of the teaching can be attained only through producing a new type of teacher. We have seen that in certain institutions which prepare teachers for village schools there is gradually developing a great, a revolutionary change of

method which will result in the change of the curriculum and method of instruction of the village school. The teachers who graduate from these institutions are going out with new visions and a new point of view. But, ladies and gentlemen, the success which will meet them and the realization of their new ideals will depend to a large extent on the reception which Inspecting Officers and other educators give them. An over-critical attitude, a joking remark, may kill what has taken months for a training institution to build up in a lad. Whereas a word of encouragement, and an understanding of some of the difficulties faced, may turn a lad into a hero who will give of his last ounce of strength to his people of the village.

It seems to me, therefore, that my best contribution, as an apostle of the new learning, will be to attempt to lay before you some of the educational principles which govern these experiments in rural teaching, and show how young teachers are being trained in these methods. I shall try to give some suggestions (1) on the ruralization of the curriculum, (2) on economy of time in teaching, reading, writing and arithmetic, and (3) on teacher training. I hope you will not suppose that the suggestions on revision of curriculum and method of rural schools can be made into a formula, the application of which will produce wonderful results. The suggestions are offered very humbly. They are an attempt to point out the lines along which experiments may be made. They are offered with full knowledge of the difficulties in the way. At Moga, we have hardly made more than a beginning. Our main hope of accomplishing more in the future is based upon the student teachers in training.

First.—How can the curriculum be ruralized? That changes are needed is clear. The Director in his last report pictured a condition all too familiar. "In the first place," he writes, "the school hours are often too long and unsuitable. Little boys, only four or five years of age, trudge to school in the early morn, and return home again at dewy eve after long hours of wearisome inactivity relieved by short and spasmodic bursts of arid instruction. The young thus imbibe a distaste for school, while the older boys become divorced from their ancestral calling on the land.....In the second place, it is essential to emphasise in every possible way the importance of the junior teaching. The headmaster is too prone to confine his energies to the teaching of the handful of boys in the fourth class, while the three other classes are left to his even more inexperienced colleagues. He likewise interprets his duties by teaching the second and third classes, and by leaving the little boys to the care of a so-called monitor. Similarly, an Inspector is inclined to walk swiftly and proudly past the cluster of little boys playing with the alphabet in the verandah in order to examine the progress of the older boys inside."

(b) The fundamental error here is in not making the child, *his* interests and *his* environment, central in the plan of the school. The village boy is not attracted to the traditional type of school because the instruction given is not related to his natural interests and impulses. The teaching is not in terms of his village life and needs. The instruction is too much confined to the three Rs. and is most formal. The village parent is also dissatisfied. The Punjab villager is a pretty practical sort. He senses that the education given in the traditional village school is of little economic value to the child. He notices that it causes dissatisfaction with village conditions and encourages the drift to the city. These are some of the conditions out of which has grown the determination of the Director and his staff to give an education to the village child in terms of the village environment.

How shall this adaptation be made ? By deriving the class room work, as far as possible, from the activities going on in and about the village itself. We must try to train student teachers to see the educational value of the natural environment. They must learn to guide and help the pupils to make observations and talk and write about what they have seen. As a class they will make excursions to fields or to neighbouring villages to gain broader knowledge. They will reason on the observations made and the knowledge gained and thus learn to think for themselves. Familiar scenes will gain new meanings. The daily reading lesson will not be so many pages to be memorized in a specific reader. It will more likely consist in reading in several books to gain certain information on a question that the whole class are interested in. Or it might be the reading of a government pamphlet about the small-pox or plague epidemic that may be just starting in their village, and about which the class wishes to be informed in order to avoid the disease themselves and help illiterate villagers as well. Their arithmetic lesson may be derived from the planning and construction of a miniature village house, or from measuring out and calculating how much land can be irrigated by the new well that is under construction near by. The lesson will not be just so many sums to which answers are to be given, but some situation in which they are vitally interested and which calls for the use of arithmetic. Where an arithmetic book is provided it will derive its sums and problems from village life in which the pupil is interested. Hygiene will have to do with the inculcating of health habits, and the improvement of sanitary conditions of the village itself. Hygiene will be an important part of the course for every class from the 1st year up. The writing lesson will not be the drawing of beautiful lines and curves in what is often called instruction in writing of letters for a practical need. The class and individual pupils will write to persons for information needed, they will write in note books their reports of facts learned. The quality of the writing will be improved through competition among the class members for the honour of writing the best letter,

which will be actually sent. Geography will not be the learning of a list of cities or districts, or the attempt to visualize the location of cities and rivers within a strange shaped outline drawn on a piece of paper or hung on the class room wall. Instead, it will involve the tracing of the route of the mail when a letter is sent to Lahore—the large towns passed through, the rivers crossed, the kind of crops seen *en route*, the one big bridge in the district to be crossed, etc. Lyallpur, for instance, would have meaning to the class because it is the place to which they wrote for information about the cattle disease. And Nature Study—why, it's all nature study. I remember visiting a school years ago. It was a village school. The teacher had hung before the class a picture of an ox. He was giving a Nature Study Lesson. It went something like this !

Teacher.—This is an ox,

Pupils.—This is an ox.

Teacher.—The ox has four legs and two ears.

The pupils repeated that sentence.

Teacher.—The ox is a strong animal and is used in ploughing.

And the boys—village boys ! repeated automatically, “ The ox is a strong animal and is used in ploughing.”

You smile, but that was not many years ago, and the teacher was teaching as he had been taught. But there was not much intelligent use of the village environment in that class period, and the teacher did not awaken much vital pupil interest.

By village environment I mean something broader than just raising crops and caring for cattle. Pupils should be given a larger outlook and interest, and see the share the village has had in the development of India in the past, and the possibilities of richer village life in the present. The Indian heritage is rich in stories, pictures and songs that bear the stamp of village life. The love of the motherland can be more easily fostered through village life and interests than through city life. The ruralization of the village school instruction should not circumscribe the village child, but should enlarge his interests and outlook. It should help him to understand and make better use of the forces about him, and through the enrichment of that life, help him to reach out to all of life.

This type of curriculum is illustrated by the experiments that are being made at Moga. The curriculum with which we are working in the demonstration and practising school is described in the definition adopted by an All-India Conference on rural education held at Moga in 1922, *i. e.*, “A Rural Community Middle School is a school which seeks to use the activities and valuable interests of the village as means for educating boys and girls for

more abundant living and service in their communities. All the work of these schools, including the vocational or practical work, should be closely related to the pupils' village environment and so far as possible should grow out of it. The vocational work should not be a separate entity but should be an integral part of the curriculum, enriching it and having as its constant aim (along with other work of the school), the bettering of present village conditions. Such a school differs from an industrial one in that it is concerned with a broad curriculum and the uplifting of the community through enriched and consecrated personality, while the latter has as one of its principal aims the training of pupils for a definite trade through which they may become self-supporting members of the community." This foundation of general education was strongly emphasized in the Director's opening speech. The type of education we are working on at Moga is pre-vocational rather than vocational.

This curriculum which is being evolved is based so far as possible upon the worthwhile interests of village boys. The changes are, however, being made gradually, and the ordinary course of study is covered in addition to the new studies. The enrichment of the curriculum is along the lines of nature study, health, education, handwork, practical mathematics, more reading and composition, etc. The teachers strive for a minimum of memorizing text-book material, and a maximum of observing, discovering, constructing, judging. Moga boys are taught to live a real life in the world in which they find themselves.

The school endeavours to use those methods of teaching which are based on recent results of the scientific study of educational processes. The so-called "project method" is not used exclusively, but the effort is made to have the point of view on which this method is based control our teaching as far as possible. For example, we endeavour to present the fact to be learned, in a situation, that is, as nearly as possible, like a situation in out-of-school life. Dr. Dewey has said, "When a pupil learns by doing he is re-living both mentally and physically some experience which has proved important to the human race; he goes through the same mental processes as those who originally did these things. Because he has done them he knows the value of the result, that is, the fact. A statement, even of facts, does not reveal the value of the fact, or the sense of truth—of the fact that it is a fact. When children are fed only on book knowledge one 'fact' is as good as another; they have no standard of judgment or belief."*

Take, for example, a boy reading in his text-book that 8 kanals make 1 ghamao. When he does an example, he is apt, as every teacher knows, to substitute 4 or 6 for 8. The fact as he read it in the book did not stand for anything that goes on outside

* "Schools of To-morrow," by John Dewey.

the book. It is just one fact of many that he reads and that may or may not stay in his memory. But the Moga boy who calculates the size of his own field in kanals and ghamaos, and with his class divides a big piece of land into plots, 1 kanal in size, *knows* that 8 kanals make a ghamao. He would laugh at anybody suggesting that 4 kanals make a ghamao. The difference in the two cases is that the average school boy "*has a result without the activity of which it is the result.*" To the Moga boy the fact is the result of an experience.

Again, a boy who has tried to memorize a table of weights, may be confused when asked by the number of chattaks in half a seer ; and not be greatly disturbed by his mistake. But when he and his class-master are running a real shop in the school-room, he suffers for mistakes. Tables which are *used* are quickly learned. In the regulation school, the boy who gets six sums out of ten correct is doing passing-work in his class. He has learned that the teacher is satisfied with that quality of work. His aim is to please the teacher, and six to nine times right, out of ten, pleases the teacher. But at Moga he quickly learns that if only eight out of ten transactions were correct, the class shop would soon be bankrupt. So the boys set 100% accuracy as their own standard. They know the value of the Arithmetic fact. Arithmetic to Moga boys is a real part of their life.

The above is a fair example of the principle which guides our efforts to improve teaching methods. Whenever it is possible, we teach through the use of a project, that is, an activity in which pupils whole-heartedly engage, because they themselves have purposed and planned it. The role of the teacher in these activities is that of a guide and friend rather than an autocrat. He helps the boys to choose activities that are rich in educational value. He helps them to carry out their purpose efficiently, to gather and master the necessary information, to learn good habits of work, to complete their project, make a permanent record of it, and judge of its success.

Since one of the essential factors of a project is its spontaneity, we cannot have a fixed "project curriculum." Often projects are repeated, but they must always be chosen by the new class. The student-teachers are not trained to follow a mechanical scheme. They have opportunity in their practice teaching to work out original projects. Illustrations of typical projects used at different times will help to make clear the method, and give some idea of the development of the curriculum. Two of the following descriptions are taken from the report of a visitor to the school.*

The Vegetable Shop Project.—Mr. Thomas writes, "The main project of class IV is the Village Shop. In Moga this is not a play project, though even as play a project of this sort can be made

* Report by the Rev. Oliver Thomas, Shillong, Assam.

most valuable. In Moga, however, the village shop is a reality, for the boys are in charge of the shop which sells the vegetables obtained from the garden plots. In order to run the shop well the boys have had to do great deal of investigation as to the way shops are run in the bazaar, how the goods are cared for, how bazaar accounts are kept, how profits are computed, what articles are required in a shop, how goods are ordered and conveyed and how paid for when ordered from a distance, etc., etc.

The demands of the shop have led the boys to build a mud brick house about 6' X 6" X 6' complete with a door, to serve as a place to store their goods, and business is carried on just in front of the building. The shop is opened about half an hour before the school opens and continues open for an hour, and then is reopened after school closes. Two boys, in turn, look after the shop each day.

Every evening boys who have vegetables to sell bring their vegetables to the shop where they are weighed and priced according to the bazaar rate which the boys find out once a week. A careful account is kept of every transaction. In one book the names of the sellers, the goods sold, the quantities and value of the vegetables are entered. In another a similar account of the vegetables disposed of is kept. These accounts are made up at the end of the month and a statement made to the Headmaster who hands over to each boy the amount due to him. The various vegetables are sold to the school mess, the families of the teachers, married pupils and the missionaries and if any are left unsold they are taken to the bazaar by the boys and sold there. All the sales are carried on in actual cash.

These boys get a very practical knowledge of money, of weights and measures. They are provided with ample material for most interesting arithmetical calculations which fully cover the prescribed course. The business of shop-keeping suggests innumerable topics for composition of different kinds from business letters to advertisement of wares, description accounts of business life, essays on vegetables, their utility, food, value, diseases, etc., etc.

As shop-keepers the pupils are interested in a wider world than that of the village. So geography of the outside world becomes a subject of considerable interest. Methods of transport, trade between different parts of the province and between one province and another, the varying products of different parts of the country and the reasons for the differences, are all matters of real interest.

I also noticed that these boys were keen readers. In addition to the prescribed Reader, the boys made ample use of the literature published in the vernacular, with which the Punjab seems to be well supplied. (Lahore alone publishes four children's magazines.)"

Moga School Project.—The boys of Class V have undertaken a study of their school from its beginning to the present day. They wanted to find out why and when and by whom the school was started, what the ideals of the founders were, and how these ideals have been developed. They are gaining an historical sense and a perspective of time which many pupils do not acquire until much later in life. Many former pupils have been called in and interviewed and their stories compared and an attempt is being made by the class to write the history of the school that will be authentic. The class also makes models of the early and present buildings. They will study the values of property and buildings and the cost of maintaining the school. They intend to make a comparative study of the hygienic conditions of the early days and the present, listing the diseases in the school, and if possible finding why certain diseases have been prevalent. They hope to list all the places in India from which pupils and visitors have come to Moga School, studying the routes of travel, mileage, cost of journeys, rivers crossed. As the geography of Class V is India, this work secures interest and purpose for their required study of that subject.

A large amount of practice in penmanship has been secured through writing letters for information and recording the facts in their note-books. Each pupil keeps his own Project Book, and there is also a special class project book in which various pupils who are selected by the class, write contributions. The pupil writing the best composition on the subject has the honour of copying it into the permanent class book. A large amount of arithmetic has been used in measuring land and buildings and making up costs for the records.

This class is developing a loyalty to the school, and a realization of the ideals of the founders which they could get in no other way. Their study of the cost of their education will give them an appreciation of its value that we hope will lead to a deeper consecration of their lives to the service of God and their fellowmen.

Hospital Project.—(This is quoted from Mr. Thomas' report). "Perhaps the most interesting and the most valuable project of all was that of Class VI, i.e., the Moga Hospital. The boys of Class VI got interested in the Hospital under the charge of R. B. Dr. Mathra Das, the famous eye specialist at Moga, and were allowed to visit it and study its work. As a result they have opened a little dispensary in their own class room where under the guidance of the teacher, who formerly studied some compounding, simpler ailments of the school boys are treated. The table and almirah for this dispensary were planned and made by the boys themselves. The medicines used are bought out of their pocket money, and the small contributions made to their Dispensary Poor Box. They have made a study of common diseases and the method of treatment; they have undergone a course of First

Aid ; they have studied drugs, their history and the countries they come from ; they have found ample material for their arithmetic and taken a keen interest in working out the percentages and averages of patient in the Moga Hospital from different parts of India, and the diseases they suffer from ; and in estimating prices of drugs. They have had experience in careful weighing of small quantities and in the use of liquid measures. They have written careful accounts of their work, and of what they have learnt. They have drawn excellent charts of the human body. They have drawn maps of the world showing the places the chief drugs come from and the methods of transport, and have studied the geography of these countries. The variety of nationalities represented in the Moga Hospital—Kashmiries, Pathans, Sikhs, Mohammadans, Hindus, and others, give a splendid starting for the study of the history of these people. They have searched the vernacular papers and collected the information into a book.

“ The day I spent in this Class,” says this visitor, “ I found the school boys requiring treatment waiting in a queue, and one boy acting as clerk and filling in the forms, which had been prepared by the class, with the name of the patient, his disease, and the prescription given in consultation with the teacher. Another boy did the dispensing, and a third boy dealt with sores. Some of the boys were preparing patients’ forms, one boy was preparing a form to record the height and weight of the class and another was attending to the register of patients. The remainder of the class was engaged in a weekly stock-taking and preparing a list of drugs to be ordered. The actual quantities required, with their cost, were written on the blackboard. The cost of the drugs required amounted to annas 12 pies 6. The teacher, thereupon, got the boys to work out by the unitary proportion and multiplication methods, the cost for a year at 12 annas 6 pies per week.

It was a great pleasure being in the class and seeing the keenness of the boys and the evident interest and pride they took in their work. The class room, too, reflected the interest of the boys, for the walls were covered with diagrams, charts, maps, and pictures prepared or collected by the boys.*

Other projects that have been successful in supplying motives for learning may be mentioned. The Post Office project in Class III develops great interest on the part of the pupils. Practically all the requirements of the Government Code are met by means of this project, and much *additional* worthwhile information and certain desirable *attitudes* are secured. A banking project, a postal map of India project, making map of Ferozepur District, the raising of fowl, the study of cotton or some other special product, have all been useful projects. Motives for short projects are constantly arising. Christmas, Easter, Basant and other special days or seasons afford opportunities for pupil activities.

* (The Junior Red Cross Society have kindly supplied much of this material.)

Making toys and gifts for others, writing of Christmas greetings, making decorations for school, etc., are all teaching opportunities when through the boys' own purposing, planning and executing, there is created greater interest in the work of the school and the complete co-operation of the boys is won.

All the teaching is not done by projects. Drill and memorizing are not neglected, though they are made interesting and vital if possible. Formal methods are often resorted to. Teachers, here, as elsewhere, show varying degrees of skill and do not always grasp the principle or live up to the ideal.

It must not be supposed that I have described these projects used at Moga as models to be copied. My purpose had been rather to illustrate teaching by projects or pupil activities. It is to make clear the idea, the principle, that education should proceed along the lines of the child's natural environment. This kind of vital, meaningful teaching, is spreading. Similar experiments are being tried at Gakkhar, at the Government Normal School, Moga, and in a number of village day schools. An increasing number of trained teachers are going out imbued with these ideals, and on fire with enthusiasm to give their best to village children. Again I plead that you should encourage them and help them to be useful.

The student-teachers are thus equipped with new methods of instruction in terms of the village environment. They are also taught to think of their schools as having a wider function than the mere implanting of information in the minds of pupils. The village school should be a community centre for all of the village, with a school for adults, a library for all who can read. Occasional lectures will inform illiterate as well as literate. Pictures and charts on the walls will teach avoidance of disease and better ways of living and working. The teachers' own magic lantern or that of the A. D. I. will supplement all of these with illustrated lectures bringing the wealth of the world's knowledge for the more abundant life. We hope travelling cinemas will become available. This new school will not be a place where "habits of apathy and mental inertia are engendered," but will open its doors to radiate life and uplift to every member of the community.

Second.—How can we save time in teaching, reading, writing and arithmetic? What has been said of the improvement of instruction in the village school has been along the line of the enrichment of the curriculum by adding more subject matter. You are asking doubtless whether this will not cause neglect of the fundamentals. Some of you are probably saying that this all sounds rather interesting but to get down to rock bottom, what happens to the requirements of the Government code? Isn't all of this teaching rather hit or miss and may it not be aimless and ineffective? Not at all. The requirements of the Government code should be kept in the mind of the teacher who

must see that they are covered before the year is up. Our actual experience at Moga is that by the use of improved methods of teaching, the skill in reading, arithmetic, etc., is attained in so much less time that this enrichment of the curriculum is possible. The pupils are so much interested that they complete much more than the code requirements in the year. A critical observer of our work has thus commented upon this point, "I have been asked several times after describing the agricultural and trade work carried in on Moga what curtailment had to be made in the ordinary curriculum to allow of this being done. It will probably come as a surprise to many to be told that not only are all the demands of the Punjab curriculum met, with very excellent results, but that a great deal more is covered. And this is very largely the result of the Project Method which is adopted throughout the school."

We must admit that there is a certain amount of skill that must be acquired by the child, as the skill in reading, the skill in writing, skill in arithmetic, etc. Our object must be to help children to acquire such skill and be able to use it. This the average school does not do quickly and effectively. Michael West, in a study of 551 Bengal children, says Dr. Mason Olcott in his book *Village Schools in India*, found that it took them an average of 10 months in school to learn their letters, $12\frac{1}{2}$ months to learn the syllables, $17\frac{9}{16}$ months to read with difficulty, and $21\frac{1}{2}$ months to read well.

Modern psychological research, as you know, has thrown much light on the most efficient methods to be used in acquiring skill in these matters and a great amount of time can be saved, by using the results of these researches. Therefore it seems to us worthwhile to give a good deal of attention in the training class for village teachers to the methods of teaching the "three Rs."

In the last few years there have been many scientific investigations made in the West on the quickest way of teaching a child to read. Tens of thousands of experiments have been made and thousands of teachers have tried methods under scientifically controlled conditions. Every step of the reading process has been observed and studied by psychologists. Numerous kinds of psychological apparatus have been invented to help in this study, and some of the greatest educators in the West have pooled their resources that we may know the best way to teach little children to read. The last twenty years have yielded more scientific knowledge on the process of teaching skill in reading than was acquired in the previous two hundred years. There is no school subject in the curriculum about which we know as much as we now do about reading. It would therefore be absurd for us to base our reading method upon opinion. It is impossible here to go into details about the best combination of methods to be used in teaching reading to beginners, but I should

like to emphasise four characteristics that are common to all the best and most successful teaching procedures :

1. The material of the reading lesson should have meaning and interest to the child from the very beginning. The first five weeks should be devoted to blackboard-reading and chart-reading based on action works, incidental reading, stories or nursery rhymes. Beginning with stories is probably the most accepted method.

2. The general procedure is from a reading of the *whole* story to a study of individual lines and phrases and then to drill on individual words which are learned by sight. The skill acquired in five weeks of such reading enables the children to begin the reading of simple book material with fluency and comparative ease. Where books and papers in the vernacular are available, children should read many stories, covering several pages each and containing many repeated phrases. The pupils should complete several books including primers and first readers, in the first year. Such practice with a familiar vocabulary gives skill in the fundamental interpretive reading habits.

3. After the pupils are well started reading, then training in the independent phonetic analysis of new or unfamiliar words is systematically organised in separate school periods.

4. By the beginning of the second year, children who have had the above lines of training do not find reading a drudgery, but something of interest. They are able to read simple material fluently and with clear comprehension of its meaning and they are able accurately to analyze and to recognize new printed words within the range of their comprehension.

Mr. McKee adapted some of the proven methods of teaching reading to Urdu. He made use of a story, very old, one of these children's classics that have been taught to children by their mothers and nurses year after year. Children love it because in it there are animals who talk and act. The frequent repetition of sentences and phrases appeals to the child's imagination. Repetition also makes possible an interesting progressing story with a minimum number of new words. It is the old story of the Little Red Hen. The results gained from the use of the story are out of all proportion to the seeming simplicity of the story itself. This is because it is based on sound psychology. It may be possible to find an Indian story with the same appeal for the little child and as good educative arrangement and vocabulary, but evidently Mr. McKee was not able to locate such a story. With this story as the basis, we are able at the Mission School, Moga, to teach children enough skill in reading and writing, so that in 5 months they can read anything within their comprehension that you write distinctly on the board, and can write any ordinary work you dictate to them. I have heard people who see these children

read say it is a miracle. It is nothing of the sort. It is only that we are using what scientific investigation has offered us. Many of our Class I pupils go directly into Class III after only a year or less in Class I.

May I reiterate that the reason that we have such success with this story method is that it is in accord with psychological laws, and not opposed to them. One of the laws of the learning process tells us that bonds are formed in the brain by practice which is attended with satisfaction and success. Therefore, it is necessary from the very beginning to have the child succeed in reading. No wonder they get bored with many months of the alphabet and meaningless syllables. In the Little Red Hen method or any other story method, children are actually reading from the very start. The repetition of words makes rapid, interesting reading possible.

A corollary of this law that bonds are formed in the brain by practice which is attended with satisfaction and success—is that we must practise the very thing that we wish to teach, and that thing must be attended with satisfaction and success. We want to teach a child to read. But we begin by teaching him to say letters, and then intone syllables. He gains this ability, for this is what we teach him. But is this what we want him to learn? Does he ever need to say letters in real life? No, but he needs to read. Therefore teach him to read. Practise the very bonds you wish to form.

Another place for improvement is in the teaching of the more advanced reading. Reading in the traditional school is mostly oral, yet in real life scarcely any of our reading is oral. Training should be given in the school in silent reading. As soon as that point is reached in the child's reading that he can recognize words faster than he can pronounce them and this should be in the latter part of Class II, or early in Class III, regular instruction should be given in silent reading. The aim is to increase his speed of reading by methods which teach him to recognize a larger number of words at a glance and to reduce the amount of time that his eye pauses over a group of words. The psychological methods worked out have brought remarkable results. An experiment made in the West in the Third and Fourth Grades showed one typical group reading 167.7 words per minute, which after special drill for seven months averaged 26.4 per minute. One class showed an increase of 50% in rate of speed after two weeks' practice in silent reading. People do not enjoy reading until the process is so mechanical that they can read with rapidity and ease. Many people do not learn this in school. It is reported that 39% of the children in India who have learned to read lapse into illiteracy. Moore, in *What is Education* says, "The problem in instruction is not to teach people how to read but to read."

Some of the same careful investigations have been made into the best methods of acquiring the arithmetic and writing skills. The use in the village schools of improved methods based on these investigations will save large blocks of time that can be used for the enrichment of the curriculum and for projects undertaken by the pupils. The use of these improved methods together with the enriched ruralized curriculum will make the pupils' work so much easier and more interesting that the difficulty of keeping pupils in school year after year will be greatly reduced.

Adult schools would also be more efficient if the teachers were trained to use these less wasteful and more successful methods. The Report of the Progress of Education in the Punjab for 1924-25 refers to the discouragement of at least one Inspector of Schools over the comparatively small number of pupils who have gained literacy certificates. The 61,000 adults who enrolled in that year constitute a wonderful opportunity. The next step in advance is to reduce the time required for these thousands to attain literacy.

The same story that is used in beginning reading for the child will not appeal to the adult. But the principles apply in both cases. Here is a splendid piece of work for some one, to adapt the story method for the use of adult schools and to prepare a manual for the use of village teachers.

Third.—The rural teachers in training must be trained in a rural environment, and learn rural conditions and occupation in such a way as to give them a healthy respect for village life. They must also learn the methods of teaching which are based on the known facts of the learning process and some of the psychology from which these are derived. They must study the child, his nature and his needs, and to study the child they must know enough about psychology to interpret what they find out. Projects are a great help in the educative process, but if these are used mechanically the result will be little better than if projects had never been attempted. There is no such thing really as the project method, as a device or a short cut in teaching. But there is a project principle, a project philosophy which will revolutionize our teaching if we apply it. It stresses the growth of the child through his purposing, his planning, his executing, his judging results. It is this point of view which our rural teachers must gain while in training. That principle, carried into the class room and allowed to dominate its methods produce a new generation of people capable of thinking and planning and more ready to take their places and assume their responsibilities in the new India.

In conclusion, may I express my gratitude to the Director of Public Instruction and all of you, particularly to Sardar Bahadur Sardar Bishen Singh, as educators and friends, for your open-minded attitude towards the new and the experimental in education. The spirit of enquiry and search for the better way is abroad

among us, and I rejoice that all institutions of learning, especially teacher training institutions are given the opportunity of contributing their share towards the vitalization of education.

But we should all be looked upon as sad failures if we viewed with any final satisfaction the few steps of progress we have gained. There is great need of research and experimentation in the field of educational psychology, in curriculum studies and in special methods, if the foundations we are living are to make possible the building of a lasting structure. Such research should not be hampered by questions of administration, or available text-books. We need scholars who will initiate experiments, carefully analyse results, draw up conclusions and make available for the normal schools and the rural schools the results of these studies. For instance, we need a scientific study of children's vocabularies, resulting in an Urdu word list to guide those who prepare readers, supplementary readers, children's magazines, etc. We need research in the field of rural arithmetic that the skill taught may best prepare the village child for the arithmetic he needs most in the village life.

Through such research and experiment undertaken by the Central Training College and by educators in the service, we may hope to achieve that gradual revision of the elementary curriculum along Indian lines, and the adaptation of methods to Indian conditions which will be the greatest contribution to the growth of the children of India.

A new day has dawned for rural education. The efforts of Sir George Anderson and you of his staff and workers are bearing fruit. I congratulate each one of you who has a share in this new day that has only just begun. But we must give our best that we may grow large enough to fill the large place that we are called upon to fill. The rising generation is calling for the best. Shall we have it to give to them ?

PRESIDENTIAL ADDRESS TO THE GIRLS' EDUCATION SECTION OF THE PUNJAB EDUCATIONAL CONFERENCE.

BY MISS L. M. STRATFORD, M.B.E., B.A.,

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EDUCATION OF WOMEN AND GIRLS IN INDIA.

The subject of education for women and girls in the Punjab has been receiving increasing attention for the last decade and is now prominently before the public. It is a subject bristling with difficulties as the customs of the country have to be taken into consideration and fully preserved. To enumerate a few of the

outstanding obstacles which are not encountered in the education of boys, I would mention the parda system which limits the girls' knowledge of the outer world and makes their going to and from schools a difficulty ; the early age of marriage which is still prevalent, though a great change of public opinion in this respect has taken place in the last 20 years ; and the distribution of the teachers trained, for women find it almost impossible to leave their homes unless for a boarding school, so we are faced with unemployed trained mistresses in large centres and scarcity of teachers in smaller places.

Also, from the very beginning, the girl child does not start fair with her brother, she becomes useful in the home in looking after the younger children and helping her mother at an earlier age than a boy. She is therefore sent to school when very small to keep her safe and happy, and attends irregularly or is taken away entirely to help at home just when she would derive most value from her studies. Also, the benefit of educating girls for their future life is not so obvious to parents as the necessity for educating boys to earn a living, and there is a point of view that the boy will grow up and remain in the home whereas all the girl is, and has, will pass to another family.

When in March 1835 an impetus was given to education for men nothing was said or thought about girls and it was not till Lord Dalhousie's time that a half-hearted start was made and it was then stated that "great prudence and caution would be needed" in the matter of girls' education so it is not surprising that has never yet been made up, and the result is that the education of women has lagged far behind that of men. Education for girls has too often been considered unessential, though a nice ornament, and many and varied are the opinions of what constitutes a well-educated "female".

To go back and review old figures, in the year 1900 in the Punjab there were 315 schools including two high schools, the Alexandra at Amritsar and the Dufferin (now Kinnaird) at Lahore and 8 Middle schools, making a total of 10 Secondary institutions. The total number of girls at school was 12,600. In 1903 matters began to improve, for it is in this year that a demand for English became apparent, yet the reports for this year show that of 132 girls in Secondary classes, 107 were in receipt of scholarships and of 937 in Primary classes, 615 were scholarship-holders ; so that about a large proportion of the number of pupils had to be coaxed to attend by monetary help. By 1905 the number of schools had increased to 561 and the number of scholars had risen to 21,769. The need of trained mistresses was realised and the Lahore Normal School for Women Teachers was opened in January 1905. There were *six* candidates for the Entrance Examination that year. By 1911 the number of schools had nearly doubled, for, whereas in the Punjab and the Frontier Province together in 1901 there were 340 schools, by 1911 in the Punjab alone the

number was 670. The number of scholars increased steadily by 10,000 every five years, from 13,700 in 1901 to over 33,000 in 1911.

The next year Delhi became a separate enclave but excluding the Delhi schools, the number of pupils in the Punjab rose by 4,000 to 37,000. By 1914 there were 830 schools, of which 6 were High schools and 33 Middle schools. That year saw the opening of the first Government High School when the Victoria School, Lahore, was provincialised and given an adequate staff. The Normal School had continued to prosper and had now 98 pupils. Then came the War. Nevertheless in the quinquennium 1912 to 1917 the increase in the number of girl scholars was 25%. In 1918 came the terrible epidemics of small-pox and influenza which devastated the homes, to be succeeded by the world unrest of 1919-20. Attention was somewhat diverted from girls' education, funds were difficult to collect, for every one was subscribing to the various War funds and charities, so aided and private schools had a difficult time. The local bodies had nearly exhausted their funds in trying to cope with boys' education. His Honour the Lieut-Governor wrote in December 1919 that "the demands on Government in connection more especially with the increased pay of establishments are such as to curtail seriously the possibilities of help from Government, so that unless new sources of revenue can be tapped it is difficult to see how any great progress can be made in the Primary education of girls."

In February 1919 a well-attended conference on Women's education was held and definite and constructive proposals were framed giving the educational authorities valuable suggestions and in some cases such as primary education proposing an entire change of policy. During that year the Government of India's resolution was received and a full enquiry into existing arrangements was made. The Non-Co-operation movement, though not entirely disastrous as it gave an impetus to handwork, had considerable effect on the girls' schools. It was easy for parents to satisfy propagandists by removing girls from schools and keeping them at home without any bother as they had often rather wished to do. Several large aided schools went off on side tracks of their own from which they have now drifted back ; and again with so many new calls on the public subscriptions and donations to girls' schools maintained by private bodies fell off considerably. It is satisfactory that work was not closed down but naturally progress was retarded. In spite of all these difficulties by 1920-21 there were 1,799 schools and 73,949 scholars and now 1926 (in April) there were 3,069 schools and attendance has risen to 17,260, an increase of 45%. Every five years has seen a steady increase of over 10,000 pupils and during 1921—26 the increase was over 23,000.

It is very disappointing that the increase in the number of girls at school should not be greater and that an undue proportion

should be in the primary classes. I do not altogether agree however with the estimate of literacy being so terribly low, for in contrast to boys, girls are taught in schools the script of their religious book which they continue to read daily so they do not relapse so easily into illiteracy for want of practice in reading.

As compared with the number of girls of a school-going age the number in school is infinitesimal and it is fully realised on all sides that it is urgently necessary to engineer a mass increase in girl scholars in Primary schools as well as to encourage large attendance at Secondary schools.

But the quality of education given must be good, for as Mr. Mayhew in his book *Education of India* writes, "Every girl who leaves school at 10 years of age after irregular attendance in badly taught classes, is using money sorely needed elsewhere." Many methods of increasing attendance and regularity have been, and are being tried including sending little girls to boys' schools, but co-education cannot be regarded as satisfactory. Mixed schools are always a source of anxiety and until the primary schools for boys are staffed by women teachers, more harm than good will result from cramming little girls into boys' institutions. At the College stage the attendance of girls at boys' colleges has been allowed, if not encouraged, but experienced educationists of the Punjab—like the late Sir James Ewing—have held strong opinion against co-education, even in this stage, and have strongly supported the opening of colleges for women to relieve the boys' colleges of the incubus. The whole question of education for girls in the Punjab as elsewhere turns on the personality and acquirement of the teacher. The provision of trained and experienced mistresses who can gain the trust and respect of the parents is therefore essential. As Mr. Fisher in his speech in Parliament on English education remarked, "In education everything depends upon the personal element. If the teacher is good, thorough in work, fond of children, alert understanding, sympathetic and firm and yet good humoured, success is secured." This applies equally or even more forcibly to India. The position of the teacher here is traditionally one carrying great honour. The parents are inclined to trust the formation of the child's character almost entirely to the teacher and very little home training is given. It is essential therefore that the mistress herself should be in every way fitted for her profession as her influence is likely to be so far reaching. Above all she needs an understanding heart and, in addition, in order to develop the minds of her children and surround them with the best influence she needs a knowledge of child psychology. To ensure that the children's physical development is not retarded she needs knowledge of hygiene and physiology so that the school may be carried on under healthy conditions and the girls may introduce into their homes the good ventilation, lighting and sanitation to which they have become accustomed at school. At present both teachers and children are so used to

living in a heavy atmosphere that often they do not realize the cause of their headaches and lassitude and therefore make no effort to get fresh air by opening windows or sitting in verandahs, and better light by cleaning the panes of glass. The provision of suitable training schools and classes for teacher has been fully considered by Government. The students who come in for training are often married women who have much difficulty in arranging for their homes and children while away at training school. They make many sacrifices of time, comfort and money. So it is essential that none of the period of training should be lost and that the staff of training school should be keen and devoted so as to put ideals of education before the students and give them truth and beauty to aim at and a wider outlook of life. Since 1924 the training has been brought closer to the homes of the students by the opening of training classes in connection with each of the Government High Schools. Well-staffed and well-equipped schools in comfortable and healthy buildings have been provided and good steady work has been done. This policy is being continued, proposals for opening more training classes are under consideration, so it is hoped that within the next decade there will be trained mistresses available for all schools where suitable provision is made for them and where they will be appreciated. Local bodies and even aided schools are still too inclined to think that the cheapest teacher is the best, and the one they want, and the life of a training girl who leaves her home to take up work elsewhere is most uncomfortable. Local bodies do not spend much on equipment for girls' schools, a blackened piece of tin hung up, or not, for blackboard and chalk when the inspectress is thought to be coming round, is considered to do a girls' school proud. The teacher therefore has to depend on herself and what she can make, for interest in her lessons.

Means of meeting this difficulty illustrated by women teachers are on view in the exhibition, including alphabet and other charts made in mud on the brick walls, a globe made on a water pot, paper pulp relief and painted maps on the walls.

In addition the trained girl has a solitary life as it is not according to custom for her to visit her pupils' homes. She is educated and anxious to read but has no books. Not even reference books. So that after school she has nothing to do but just her own simple house work. For the married teachers there are other difficulties not experienced by men. A man teacher comes home and finds his meals ready and the wife and children happy at his return. The women teacher has to cook and tidy before going to school, probably to manage a fretful baby in addition to her class work and when she returns home tired she has to cook the food and look after the house. So the lot of a teacher is not very enviable.

As regards higher education Miss Harrison is dealing with the subject more fully on 20th but I will just mention that one of the

cheering features in the Punjab is that directly there is a really efficient and well-staffed high school it is full to overflowing and the girls are really keen and love their studies. Attempts to switch girls off to School Leaving Certificate from Matriculation courses if they were not intending to go to college have been made, but as is written in the report of women's education in Bengal, have met with no response.

This year there were 167 girl candidates for Matric, and only 16 for School Leaving Certificate. But the numbers are double those of 920 when for high school examinations there were only 80 candidates. This is satisfactory, for there are now two women's colleges teaching up to the degree standard, and the Matriculation has been made compulsory for those entering the Ludhiana Medical School as well as the Lady Hardinge Medical College, Delhi.

Primary education for girls is one of the principal questions of the moment and is a crying need. How best to supply it and bring it into touch with the home, yet make it something wider than just instruction in the three Rs. during the very short school life of the child is a problem. Subjects such as home hygiene, elementary laws of health, invalid cooking and care of children are essential to the rising generation. It has not yet been possible to get them taught through daily practice and book knowledge is not of much advantage. Many of the village schools are so badly housed that they serve rather as a warning of what should not be rather than models of what should be. Over-crowding is at present a crying evil in these schools, especially in the baby classes and even in advanced cities like Lahore one finds one poor untrained mistress trying to teach 70 or more little ones each with only just room to sit crushed up against her neighbour. Needless to say there is no scope for employing the children's natural activities for their educational development much less for physical training.

Elementary education for special classes such as the criminal tribes is receiving attention and is of great moral value though I am doubtful of its appreciation. As one mother said, 'My girl could talk down every one and give the best abuse and now you have had her in school and she has forgotten even how to give good *gali*'.

Much remains to be done in educating the depressed classes. There is a mass mission movement and some societies such as the Arya Samaj are beginning to take an interest in this side of the question.

As regards adult education the hope of future lies in attracting the young girl who has left school very long or has missed education in her childhood. Zanana classes existed for many years but were of very doubtful value, for the women read irregularly and had not the habit of study so that they did not make much progress. The leisure hours in the home are between 12 and 5

and as the school-teachers are busy at that time, part-time teachers could not be employed and this meant heavy expenditure on staff in house teaching. On the other hand, there is a real demand among young married ladies for English accomplishments and home crafts, and the High Schools have many applications for special classes. It is encouraging that interest has been aroused in these subjects. The Indian girl is particularly gentle and adaptable and tries to be whatever her people wish her to be. Now that men are preferring accomplished and English speaking wives and sisters, the girls are trying to fit themselves for a wider social life.

There is also the other side of the picture. Well-educated girls are often not too keen on marrying *any* kind of husband and naturally wish that the family arrangements made for them should be such that the boy they marry should be, at least as well educated, and have as high a moral standard as themselves. Among our teachers it is often found that the wife earns to support the home, whilst the husband either from lack of education or from idleness, does nothing to help. I remember a few years ago an application from a man asking for a pension as his wife, his only support, had died.

To meet the demand for home craft a special inspectress or rather instructress was appointed in 1918. She has held classes for 3 months in the year for intensive instruction in the home arts, and visits all parts of the province.

As regards religious education two papers are going to be read on this debatable subject but it is strongly felt that all moral progress depends ultimately on religion, and the religion learnt by a child at its mother's knees is the one it practises during life. Unless girls are well grounded in their faith it will be impossible for them to pass it on intact to their children. Subjects entirely disregarded at school tend to be disregarded at home also, hence the dire necessity for parents and schools to co-operate, whatever the difficulties may be. At the same time meeting and making friends with school companions of other views tends to inculcate religious tolerance, which is of such importance to the state.

Industrial education within or without the education department has received a great impetus during the last five years. Owing to the practical interest of Sir Ganga Ram the Government Home for Hindu Widows was started; here a training is given to teachers and side by side with this home industries are taught enabling most uneducated widows to earn their living.

Specimens of the work done, weaving, stocking-making, embroidery are on view in the exhibition. From this has grown the large industrial school in the city where girls and women come to learn one or more crafts and leave after gaining proficiency.

There is also an industrial school which was formerly attached to the Government Weaving School which has improved greatly during the last five years.

In the village elementary schools, such as Khushapur, beautiful pillow lace is made and in some places, such as Clarkabad and Jagraon, cloth and newar are woven, and embroideries beautifully carried out. In many schools spinning which is such a good handicraft for girls has been revived or introduced. Specimens of needle work done in schools varying from highly coloured embroideries in rather glaring patterns to really beautiful design and *stitching* in net, *tilla choba* and *kashidia* can be seen in the exhibition.

Health of School Children — The health of girls in boarding schools is usually good. It is principally in the autumn term that on return from the holidays children are ailing and get fevers. A Lady Doctor is in charge of each school, so medical attendance is available at once and usually health is soon regained. A beginning is being made of keeping health cards showing the child's record during her school life. Classes are held as much as possible under trees in the fresh air and the improvement in sites for girls' schools by placing them outside the city in pleasant grounds is having a great effect on general health. In day schools too an improvement is noticeable, but still there is not much idea in the villages of keeping children with small-pox or measles away from others. In all the boarding schools and larger day schools inoculations and vaccinations are regularly carried out, as needed, and do not raise storms of objections as in former years.

Wherever space allows and even where it is restricted, skipping and games are regularly played and in all the boarding schools keen interest is taken in badminton, volley ball and running and skipping, and the children learn to play for a side and unselfishly.

Inspection.—There are now 3 circles for inspection with three Assistant Inspectresses for each circle, but the work is very heavy and we hope ultimately to have one lady in each district responsible for about 100 schools.

The future holds great promise. Women are beginning to be appreciated at their proper value in the world and no longer considered as more or less charming incidentals without authoritative influence till they are too old to enjoy wielding it.

The disastrous results of side-tracking women's education and considering it as an interesting offshoot of general education have been realised and it is now felt that the need of India is not only crowds of men graduates but educated and enlightened wives and mothers in the homes. The Punjab is fortunate in having enterprising and devoted religious and private bodies, which are furthering the cause of women's education at much expense and labour, and Government is using every means in its power to accelerate the pace and ensure that all the energy expended may be fully effective. Indian ladies are gradually coming forward and taking their part in advising and managing schools. Their help is what is needed to give right direction to the advance.

PRESIDENTIAL ADDRESS TO HEALTH SECTION.
THE MEDICAL INSPECTION OF INDIAN SCHOOL
CHILDREN AT SIMLA.

BY MAJOR J. R. D. WEBB, O. B. E., I. M. S.,

Medical Officer of Health, Simla.

The medical inspection of school children and school premises at Simla was begun by me in September 1923. Prior to this date, this work was not considered to be one of the duties of the Medical Officer of Health, and no system of the kind existed.

Simla with its season population of about 45,000, collected within a restricted area, is perhaps particularly well situated for work of this nature.

Until December 1924, only the primary classes of boys between the ages of 6 to 11 years were dealt with. The total number so handled was 731. In late 1924, the Simla Municipality, realizing the success of such work, made a representation to the Punjab Government and recommended that Government should extend this work to all boys in Simla.

The Government accepted this proposal and appointed a whole-time Sub-Assistant Surgeon as School Medical Inspector to work under my direct control. Thus, 2,270 school boys came under medical supervision in 1925. The results obtained during 1925 were so good, that Government re-appointed the school Medical Inspector for 1926 and the work has continued successfully. With the aid of two Lady Doctors of the town, who have worked in a voluntary capacity, the work has also been extended to all Indian girl schools in the town during the year, 529 girls having also come under supervision. This extension of the work can be regarded as somewhat of a triumph, because the prejudice of mothers and the purdah system make such work difficult to introduce;

The cost is estimated at one anna per child per mensem, excluding the cost for instruments, printing of stationery and medicines.

The medical inspection of school children in the world generally is a work which is of comparatively recent birth.

Following a sequence of events in England and Wales dating back to 1870, which time will not permit my entering into, it was not until 1907 that the public conscience was really awakened to the unsatisfactory condition of school children in England, and that this work was really established under the provisions of the Education Administration Provisions Act.

Progress at first was slow, but gradually clinics were opened for treatment, and in 1912-13 the Board of Education issued

regulations for the first time, sanctioning grants-in-aid for the medical treatment of school children, the total grant being limited to £60,000. Local Education Authorities were thus enabled to increase their arrangements for treatment by clinics and in other ways. There are now more than 1,395 clinics provided by 312 out of the entire 317 Local Education Authorities in England. The most recent being that which was opened at Birmingham in September of this year.

In 1923-24 the Board of Education allowed a grant up to £600,000 for the purpose of inspection and treatment, while the total gross cost of the school medical services in that year amounted to £1,220,268 which is about one-fifth the total sum spent on public elementary education. This is a very small premium for rendering education a useful asset and for improving the physical and financial well-being of the nation.

The need for such work in England and Wales was obvious, when, in 1916, it was estimated that of the six million school children :—

- (1) 3 millions were in need of dental treatment.
- (2) $\frac{1}{2}$ million had bad eye-sight and could not take advantage of their lessons.
- (3) $\frac{1}{2}$ million suffered from ear and throat diseases.
- (4) $\frac{1}{2}$ million were verminous.
- (5) $\frac{1}{2}$ million were ill-nourished.
- (6) And many suffered from Skin diseases and Tuberculosis.

If this was the state of affairs in England and Wales in 1916, what is the present state of such children in India, and would their physical and mental condition bear comparison with those of England and Wales? Are the Central Government of India or the Local Governments taking action in this most important question for India?

The system of medical inspection at Simla, which is now in practice, has been evolved by closely studying similar systems in other parts of the world.

The system embodies :—

- (1) A monthly medical inspection of each child, with a view to the prevention and cure of disease.
- (2) The assured treatment of affected children.
- (3) Quarterly reports of the above results, which are combined to form an annual report.
- (4) A monthly inspection of school premises, followed by quarterly reports combined to form an annual report.

The monthly medical inspections are conducted at the school premises. Each child in every school is examined once per month during the school-year (March to December). These examinations are not mere cursory glances, but consist of a systematic overhauling of each child. The inspection is made by classes, so that the routine work of the school is not interfered with. Class teachers attend while their children are being inspected, in this way, they receive instruction in the elements of the examination. The children are paraded in batches of five or six, stripped ready for inspection. Each child passes before the Medical Inspector, who first notes the name of the child, the name and occupation of the parent, height, weight, chest measurements, general physique, previous illness, and family history.

At subsequent examinations, height, weight, chest measurements and general physique are recorded quarterly. During 1927, each school at Simla will be supplied with its own apparatus, so that class teachers will be able to make monthly examinations of their children for height, weight and chest measurements. These results will be charted in each class-room.

The child is next rapidly examined from the crown of his head to the soles of his feet. Special attention is paid to cleanliness, skin diseases, ear diseases, deafness, eye diseases, eye-sight (distant and near), nasal diseases, throat diseases, dental diseases, oral sepsis and mental capacity. Following the examination, the record for each child is entered on an index-card. Each child has his or her corresponding index-card. The index-cards are so prepared that each shows the complete monthly medical record of the child, extending over a period of six years, further, the minimum amount of writing is required for the entries. These are made by figures or by a plus or minus sign.

An average of two to three minutes is spent on the examination of each child, but at subsequent monthly inspections the healthy children become personally known to the examiner, and are rapidly passed over, while more time is devoted to children who do not show sufficiently quick improvement under treatment. It is well known that the examination of a child in England is said to take about 8 to 10 minutes, but these examinations are only made thrice during the child's school-career, while the Simla child is inspected each month.

The treatment of affected children is the crux of school medical work. In Simla, treatment is divided under two headings :—

- (1) Those children requiring minor attention such as lack of a bath, a hair cut, teeth cleaning, dirty finger nails, poor physique, etc.
- (2) Those children requiring definite medical attention.

For children falling under the first heading, the class teacher prepares a list, at the time of inspection, under the direction of the examiner. This list shows the name of the child, the affection and the required treatment. It is presented to the head-teacher after the examination of the whole school is completed, and the teachers are responsible that the children receive the required attention before the next monthly inspection. Teachers guard these lists very carefully and experience shows that action is taken on the recommendations made. In each school class marks are given each week for cleanliness, and each class teacher maintains a register for this purpose.

For children falling under the second heading, a post-card with perforated margin printed in vernacular, is issued to the parents of the child stating whether the child requires treatment at the hospital. These post-cards are prepared from the index-cards at the time of the examination. Acknowledgment of the post-card by the parents is received by means of the return to the school of the perforated margin. These are subsequently checked.

On the card, the parent is advised that the child has been examined and found to be suffering from a defect and stating the required action. A threat is made clear on the card to the effect that if the child is not medically treated, recommendation for its exclusion from the school will be made to the school authorities until such time as the child is treated. Fortunately, it has not been necessary to put this into action. This post-card is then presented by the parent or by the child itself at the nearest hospital dispensary or to a private doctor, who treats the child and notes on the post-card the treatment given. These cards are collected from the hospital dispensaries and private doctors in Simla at the end of each month and classified according to schools. The number so collected forms a check on the number of children who have actually received medical treatment. At subsequent examinations, should children be found to require continued treatment, a second similar post-card, called the "Continued Treatment Card" is issued to the parent, re-collected, and checked in a similar manner to those as above described.

The treatment recommended for each child is entered on his or her index-card at the time of the monthly examination by a plus sign. At subsequent inspections, the examiner sees whether the child has, or has not received treatment and he records this on the child's index-card by either a plus or minus sign. In the latter case, he makes close enquiries as to why the child did not receive the treatment recommended at the previous month's examination.

At the end of each school-quarter, a report is compiled from the index-cards, and these results are embodied in a very comprehensive chart.

These results indicate, under the heading of each school :—

- (1) The number of children examined.
- (2) The number of children recommended for treatment.
- (3) The number of children who actually received treatment.
- (4) The disease from which the children were found to be suffering.
- (5) Remarks on the general health of the children.

At the end of each school-year, the Medical Officer of Health examines each child's index-card, and from the contained results, he enters his note on the last page of the index-card. This note briefly states the progress or otherwise in the health of the child during the year. This also forms a check on the work executed by the School Medical Inspector. From experience, I find that it takes me only $\frac{1}{2}$ to 1 minute to check one index-card, and in so doing, to review the medical history of that child for a whole year.

INSPECTION AND REPORT ON THE SCHOOL PREMISES.

Such inspections are made by the School Medical Inspector once per month, and are checked by the Medical Officer of Health once during each school-quarter. The results of such inspections are recorded on a quarterly chart, which chart is similar to that used by the Liverpool Corporation. Details of the sanitary condition of each school, with recommendations for improvement of defects are embodied on the chart. These recommendations are repeated each quarter until action has been taken to remedy the defects. In this way, many improvements at the schools in Simla have been effected.

Further advantages of the system consist of :—

(1) *The Examination of Eye-sight* :—

Those children found, on examination by rough tests, to be suffering from defective vision, are carefully re-examined by retinoscopy and the necessary spectacles are prescribed. The Municipal Committee has allotted a grant of Rs. 500 to provide spectacles for children whose parents are too poor to buy them. In such cases, the free or part free provision of glasses for the children is ensured. The spectacles are supplied by Messrs. Walter Bushnell at contract rates, as this firm is very reliable.

(2) The general state of the Simla school child in regard to cleanliness is now very good. During 1925 and 1926 the Municipality gave a grant of Rs. 150, which was spent in providing prizes consisting of soap, pocket-handkerchiefs, towels, copy books, ink-pots, pens, pencils, etc., etc., for the children who obtained the highest marks at each school in general cleanliness.

during these years. This acts as an incentive to children to keep themselves clean and has had an excellent effect.

(3) *The Treatment of Dental Caries* .—

Although the Municipal Committee have given grants for the provision of spectacles to poor children and the supply of prizes for cleanliness, yet they have refused so far to give a grant for the treatment of dental caries, consequently other arrangements had to be made. Three Indian dentists of the town offered to attend to the school children at reduced rates, providing such children brought with them a certificate from the School Medical Inspector.

This system was introduced during 1926 and has worked fairly well, but unfortunately there are still a large number of children suffering from dental caries whose parents are too poor to afford this expense.

I still hope to secure a grant from the Municipal Committee for this purpose during the coming year.

(4) Educational posters have been printed in English and Vernacular and are hung in the class rooms. Teachers utilize these posters for the instruction of the children.

(5) Regular weekly educational lectures and cinema displays are given for the school children, who eagerly attend.

These lectures are held at the Lady Reading Lecture Hall, which is fitted with an up-to-date cinema and lantern projector. Similar lectures are held by the school authorities at the schools.

By this means, the simple principles of hygiene and knowledge concerning communicable diseases are imparted not only to the children but also to the teachers and such educational activities are found to be of the greatest value. At the time of medical inspection, or should the Inspecting Officer meet a group of children on the road, he undertakes informal talks concerning the rudiments of Public Health. Such informal talks are very important.

(6) Open-air classes are regularly held at each school and debilitated children are especially dealt with.

(7) Games for all are regularly played, while regular drill exercise classes are also held.

(8) During 1926, a mid-day meal was introduced twice weekly at one school. This proved a great success. At present other schools employ contractors who sell the children sweets, etc., during the recess intervals, and local vendors also come to the school gates and sell the children food which is generally unwholesome or bad, hence I hope a general system will be introduced in 1927 for mid-day meals at all schools.

(9) Any child found suffering from an infectious disease is at once removed from the school to the Isolation Hospital. In this way school closure is entirely unnecessary and is avoided.

(10) School teachers are medically examined and treated. Ensured health amongst teachers is a very important matter.

(11) The Simla public is perhaps not yet sufficiently educated to permit of the attendance of parents at schools, while medical examinations are in progress, as they do in England, but many parents took a keen interest in the school section of the Health Week exhibition which was held at Simla in June last, and they saw how the routine medical inspections are conducted.

(12) The system has been extended to the Indian Hill States immediately surrounding Simla. The State Doctors make the inspections and regular reports are submitted.

(13) To ensure co-operation between school work and child welfare work, all infants and young children of the pre-school age are card-indexed at the Maternity and Child Welfare Centres. In course of time these cards will pass to the schools. Thus a complete medical record of the child will be kept from birth up to the age of leaving school.

After 3 years' experience, it seems only right that I should give a brief account of the results which have been obtained by this work.

In 1923-24, as already stated, only 731 children of the primary classes were medically inspected; of these 67% were at first referred for treatment. By the end of 1924, this percentage had been reduced to 33.03%. These results were obtained by assured treatment.

Out of the total number recommended for treatment for September to December 1923, 45% actually received it, while by December 1924 this percentage reached 86.03%.

In 1925, as already stated, school boys of all ages at Simla came under medical supervision.

During the six months period June to November, 9,304 inspections were conducted, the estimated average attendance of boys during this period was 2,270. It can be readily understood that, due to various causes, the actual number of boys attending school vary from month to month. At the first inspection, 81% of these boys were referred for treatment, whereas at the end of the year 30% were referred for treatment.

It was estimated that 80% of the boys recommended for treatment received it during 1925.

In 1926 as already stated, both school boys and girls came under medical supervision. From March to August, 10,871 inspections were conducted. An average of 1,700 boys and 480 girls attended the schools each month during this period.

At the first inspection, 52% of the boys were recommended for hospital treatment, while 44% were recommended for attention by the masters ; of these, 61% received treatment of the hospital and 64% received attention by the masters. It must be understood that many of the boys received treatment under both headings. In August, the percentages had been reduced as follows :—20% of boys were recommended for treatment at hospital, and 26% for attention by the masters.

At the first inspection of the girls, 75% were recommended for hospital treatment and 46% for attention by the mistresses ; of these, 61% received treatment at the hospital while 82% received attention by the mistresses. The same remark regarding the boys also refers to the girls, namely, that many girls received treatment under both headings.

In August, the percentages had been reduced as follows :—43% of girls were recommended for hospital treatment and 20% for attention by the mistresses.

The results of the last quarter of 1926 cannot be included, because at the time of writing this paper the inspections are still progressing.

While considering the results, it must be remembered that the Simla population is almost entirely a seasonal one, fluctuating with the change of Government office employees, hence, we estimate that at the opening of the school year only 60% of our former children return to us, the places of the remaining 40% are taken by new-comers.

The results therefore be improved as rapidly as we should like, because each year we have to make a fresh start.

If a similar system was universally adopted in the plains, this difficulty would be largely removed.

I believe that no previous statistics have ever been compiled in regard to height, weight, chest measurement and general physique for Indian school children. Such averages for the Indian school child at Simla have been worked out.

Comparing these results with those obtained in England, we find that the Simla school boy maintains a similar height to the English boy up to the age of 14 years, although after this age he is of similar stature, while the Indian girl is less in height throughout the ages than her English counterpart.

In weight, both Indian boys and girls are generally less throughout the ages than English children. The Simla children reach half their adult weight at about 12 years, similar to English children. The chest measurements of the Indian boy are generally greater than those of the girl.

In 1925 4.1% of children were found suffering from defective vision while in 1926 1.5% were detected. During both years, all cases were corrected with spectacles, with the exception of those children found suffering from diseases of the eye which could not be improved by the wearing of spectacles.

As in England, so at Simla, we find that it is sometimes very difficult to persuade parents to allow their children to wear spectacles and it is by personal letters and interviews that we have achieved this success. One parent amongst many wrote to me, "I am a farmer and it would be a disgrace to allow my son to wear glasses while ploughing the fields."

In England and Wales, it is estimated that 10% of children suffer from visual defects, and the condition is said to be worse in large cities, as compared with County districts. (The Lancet).

In England, difficulty is experienced in ensuring that children will wear their glasses. (Liverpool reports). I have not experienced this difficulty at Simla and I attribute it to the constant supervision which the children undergo.

In 1925, 11.4% of children required dental treatment ; of these 0.7% had 4 or more carious teeth. In 1926, 15% were detected with dental caries and by August of the same year the percentage had been reduced to 9.1%.

Complete reduction was not effected owing to the reasons already explained above. Our results show that girls suffer more from dental caries than boys.

In England and Wales, no less than 54.6% of children suffer from dental caries and a large proportion of these have 4 or more decayed teeth. (The Lancet.)

The smaller proportion of dental caries in India as compared with England, may not unreasonably be attributed to differences in diet of the two races.

In 1925, 51.3% of children were found suffering from enlarged tonsils and adenoids. By treatment this percentage was reduced to 7.9, while in 1926, 22.8% of the boys and 47% of the girls were found suffering from these conditions.

By August, the percentage in boys had been reduced to 8.8%, while that in girls had been reduced to 12%. It is interesting to see that girls suffered more than boys in 1926. In fact

these two conditions attracted more attention during the inspection of the girls, than any other disease.

Children between the ages of 7 and 12 are mostly affected and Hindoo children suffer more than Mohammedans and others, We find a tendency for those children returning to Simla, at the opening of the schools, and after residing in the plains for the winter months, to suffer most. We find that the nasal and throat mucus membrane generally becomes congested and inflamed when children when first arrive back to the hills from the plains.

It is stated that 37% of London school children have adenoids and that 72 to 76% have enlarged tonsils as well. (The Lancet.)

Just as in England, so at Simla, difficulty is experienced in inducing parents to have their children operated upon and it is only by personal interview that I find this can be achieved. Children operated on at Simla for this complaint are given special breathing exercises after the operation.

The percentage of goitre cases in 1925 was 2.5%, which by suitable treatment was reduced to 1.5%. In 1926, 1.0% of the boys were affected and by treatment this percentage was reduced to 0.6%. Girls did not appear to suffer from the complaint as much as the boys.

Mr. Carrison writes, "20% of the population in the Himalayas suffer from goitre." The Simla school boys and girls are not all permanent residents of Simla which may account for this discrepancy.

Malaria, enlarged spleen, and Anaemia are diseases which require more attention in the plains than they do at Simla.

We find that those who suffer from acute attacks of malaria at Simla have invariably brought this disease up with them from the plains. Residence in the hills alone is sufficient to improve all three conditions and we find our results substantiate this belief.

The incidence of enlarged spleen at the beginning of 1925 was 16.4 % which by the end of that year was reduced to 0.3%.

In 1926, the percentage was 3.1% in boys and 6.4% in girls, these percentages were reduced to 0.6% and 1.5% respectively by the end of August 1926. A greater percentage of girls had enlarged spleens than boys.

The routine monthly inspections result in a much higher standard of general cleanliness amongst the children with regard to the state of their heads, bodies, hands, teeth and clothes.

The standard of cleanliness is generally at a minimum when the schools open in March, but as the school year proceeds, so the children learn to keep themselves cleaner.

In 1925, 26% of boys were found unclean which percentage was reduced to 6.4% by the end of that year.

In March 1926 of the total number of boys examined 3% had unclean heads, 6% dirty bodies, 30% dirty hands, 12% dirty teeth, and 26% dirty clothes whereas by August, these percentages had been reduced to, unclean heads .08, dirty bodies 1.6%, dirty hands 18%, dirty teeth 8% and dirty clothes 17%. Of the girls, the first examination showed that 6% had dirty heads, 12% dirty bodies, 27% dirty hands, 22% dirty teeth and 10% dirty clothes, whereas at the last inspection, these percentages had been reduced to dirty heads 4%, dirty bodies 1%, dirty hands 6%, dirty teeth 4% and dirty clothes 8%.

The only difference between boys and girls in 1926 was that the girls' clothes were cleaner.

In 1925, 2.7% of the boys were found suffering from ear diseases as against 1.9% in 1926: these percentages were reduced by treatment to 0.55% in 1925 and 1.5% in 1926.

To ensure the success of a system, such as that described above, a trustworthy and competent School Medical Inspector is necessary, and his work should be supervised by a Medical Officer. Unfortunately, it is difficult to attract subordinate doctors of the right stamp to readily take up and adhere to preventive medicine, because they know that the curative side of medicine is more lucrative. This is my experience at Simla, During the past three years I have had three excellent School Medical Inspectors working under me, but, sad to relate, the cry of each one in turn has been, "I like this work, but I know it will pay me better to be appointed to a dispensary." I consider the time has arrived when Government should consider the adequate compensation of Subordinate Doctors working at preventive medicine, so that they will not feel this branch of medicine is a back-water. After all, prevention is far better than cure; and it is by this work, that the health of a nation can be raised.

Some say that the introduction of such a system for a large city in India is difficult, because large number of children would necessarily entail the employment of a costly inspecting staff. From my experience, one intelligent School Medical Inspector could readily handle 3,000 boys by this system, provided the schools are not too scattered.

Others say that as education is not generally considered compulsory in India, therefore only a small proportion of the children of school-going ages would be dealt with.

Fortunately in the Punjab, as you all know, education is already compulsory for boys between the ages of 6 and 11 years in 290 school areas. A school area may include as many as 50 or 60 villages.

From a census of school boys taken at Simla in 1925, it was estimated that, with the exception of about 60 boys, all children between the ages of 6 and 11 years attend school.

It was further estimated that 63·2 per cent. of all boys of school-going ages, up to 18 years, attend school at Simla.

In consequence the above system at Simla now deals with practically all boys between 6 and 11 years and the greater proportion of boys of other ages up to 18 years of age.

School medical work does not only consist of the detection and cure of diseases, together with the compilation of statistics, such as those above stated.

It has for its real ideal, "The increase and spread of knowledge in health teaching." To be effective, it must be regular, thorough, and inclusive. The child must not only be effectively supervised early in regard to his physical development, but his mind must also be trained. It is often a disorder of function, rather than a definite disease which is presented for consideration. The co-operation of parents and school teachers must also be gained.

Under the section of treatment comes the spread of knowledge of health, and this can be most readily effected through the child.

It is an exceedingly difficult task to convince adults of any country, but more especially in this country, even the educated and enlightened ones, to change time-honoured customs, whereas, in my experience, with the child, this proves to be a much easier problem.

This, therefore, is the real way of attempting to prevent many ailments which may occur in future generations.

The school is the logical place to inculcate the value of preventive medicine.

School medical work at Simla represents a pioneer work in the Punjab.

In attempting to present to you the system with the results which have been attained during the short space of three years, I am sure you will realize that the present state of our Indian school children at Simla is not a typical representation of the health of school children generally in the Punjab.

A report recently appeared in the newspapers when Doctor David Lees, a member of the British Social Hygiene Council, which is now touring India, referred in his first speech to the necessity of introducing school medical work into India on Western lines.

In the course of his speech he said, "As far as I know such a system has not yet been introduced into India."

Dr. J. E. Sandilands (Medical Officer of Health, Bombay) subsequently corrected Dr. Lees in respect of the Bombay city, and I could not resist sending him a copy of our last School Medical Inspection report. This report was acknowledged with thanks and with an expression of considerable surprise.

In conclusion, I am convinced that School Medical work is one, if not the most important, medical work by which the health of a nation can be raised and I consider that the Central Government should have a genuine feeling of dismay on account of the present generally neglected position of this work in India.

SELECTED PAPERS.

THE STUDY OF GRAMMAR.

BY M. AHMAD DIN AZHAR, B.A., B.T.

I do not propose to encroach upon the teacher's liberty, much less to slight his intelligence, by placing in his hands a cut and dried scheme of how he should teach grammar in the schoolroom. Rather shall I review the current grammatical notions and ask you to see if some of them have not already outlived their usefulness.

It would seem strange now but not very long ago, the only, or, at any rate, the main plea for the inclusion of grammar in the school curriculum was that it trained the pupil's faculties. That grammar is, and ought to be, there only because it helps in language study is to-day realised beyond question.

This shifting of the aims has been accompanied by a no less marked change in the definition of the word grammar itself. In 1795, Lindley Murray had defined grammar as the "Art of speaking and writing the English language with propriety." What that propriety meant we shall presently see. As recently as in 1920, "The Report on the Teaching of English in England" defined grammar as the "Description of construction", nothing more, thus changing the entire conception of grammar. To the former, grammar was prescriptive and taught language as it ought to be. To the later, it is purely descriptive. It does *not* attempt to teach people how they ought to speak, but, on the contrary, it merely states how as a matter of fact certain people do speak at the time at which it is written. It studies language as it actually lives and stands. The Board of Education's Circular on the Teaching of English in secondary schools (1910) rightly says, "There is no such thing as English grammar in the sense that used to be attributed to the term."

What an enormous change of view! And yet, strangely enough, the old, age-long grammar is still suffered to hold the field in our secondary schools. Let me quote again from the Report on the Teaching of English: "Not only do the aims of English grammar teaching need restating but its methods need radical reform. Nearly all text-books on grammar are written as if English were a dead language. Their rules, examples and exceptions are expressed in the form of our conventional spellings rather than of the spoken words or syllables which those spellings represent, often very inadequately. Few school grammarians appear to realise that a living language is composed of sounds, not of letters; for example, to state the rule for the plural inflexions of English nouns in terms of spelling without the use of phonetic symbols is quite misleading. The teaching must be closely allied with phonetics since the first fact to be learnt about language is that it is composed of sounds and since there are some grammatical notions which it is impossible to convey without the use of phonetic symbols.' "

Ballard, a great linguist, has the same views: "Is the study of the fundamental grammatical relations best approached, as our forefathers thought, through a highly inflected language like Latin, where those relationships stand out clearly and arrestingly, or through the mother tongue where inflexions are few but usage is familiar?"

The word grammar was first used by the Greeks as meaning "the study of all the facts of language as they stand", a view which is in entire agreement with that of to-day. It would be worth while inquiring how the word fell into disuse.

The language that held sway in Europe in the middle ages was Latin. It was the language of literature and culture, religion and politics alike. Its study was divided into three branches—

- (i) Rhetoric, or study of elegant Latin ;
- (ii) Dialectic or a study of Syllogism—Logic.
- (iii) Grammar, or a study of Latin usages and forms.

When grammar was first introduced into English, Latin was a dead language. It no longer possessed the vital progressing power which a living language alone does. Its form was therefore fixed and grammar meant the art of writing Latin *in* that fixed form and *according to* that fixed form. English had no grammar of its own. "The vulgar grammar maker," as Hales has so aptly put it, "dazzled by the glory of the ruling language knew no better than to transfer to English the schemes which belonged to Latin."

And thus was a living and so a changing language compelled to conform to the standard of a defunct and fixed language. English grammar, therefore, meant little more than the application of Latin linguistic standards and notions to English. This was the propriety which the strict grammarian would not have any one speaking English deviate from.

This transference of linguistic conception was disastrous. For notions derived from one language cannot be applied to another in entirety, any more than can the notions derived from life itself of one race be applied to that of another. How much less those of a dead language to a living one! And ever since, grammar has been doing its duty not so much by the language it came to render service to, but by the one it was derived from, crushing the English instinct, sophisticating it with deliberate Latinisms and changing spontaneous English into artificial.

The amateur grammarian has thus mistaken Latin grammatical form for universal grammatical form, which he solemnly declares to the world every language possesses, which is intrinsically correct, which is independent of usage, which exists and has always existed, and which is now in danger of losing its

existence ! Those of his way of thinking, the Defenders of the Faith, include, among the enemies of the speech they are voluntary guardians of, the careless slipshod writers and the slovenly speakers who mumble their syllables instead of articulating them. True, they confess to their own shortcomings in their personal speech, but they make up for them, by the zeal with which they come to the rescue of their fellow sinners. But the funny thing is that even while they are holding their solemn hand of warning against what they call "vulgarisms", these "vulgarisms" are naughty enough to avenge themselves by finding their way into their own speech. The admonition comes "*Don't* ever use such vulgar forms as *don't* or *won't*. You *won't* hear educated people using them." The exhortation, as it stands, does not prove anything but their being uneducated. Or, again, "Never use a preposition to end a sentence *with*." Or we may hear them say "Oh, *I've* got something else to tell you ; don't say *I've* got instead of *I have* got."

Now even if we admit these forms as vulgarisms, the fact remains that they are found in the speech of those educated Englishmen who so frequently denounce them. They are, therefore, established usages, and '*ipso facto*' no longer vulgarisms, even if they were so once. For, surely, no one can offend against the grammar of his own dialect.

This nervousness of the English grammarian flying in the very face of the genius of his mother language is a very high tribute to the sway Latin holds over the English mind. Dryden himself, a master of English prose, confesses to this tendency of crushing the English instinct, and in very explicit terms, too, "I am often put to a stand," he says, "in considering whether what I write be the idiom of the tongue, and have no other way to clear my doubts but by translating my English into Latin."

Now we are studying what exists. We have no right to be ethical. And for English or for any other living language for the matter of that, to conform to a fixed standard is tantamount to its being a dead language. English lives and is ever in a stage of flux. Its grammar therefore should be only statements of the majority of the speech habits, classified and categorically named, purely on grounds of economy.

I have alluded to the vicious tendency on the part of the grammarian to transfer all notions from Latin to English grammar. It must be understood that when I said this I did not imply wholesale condemnation of such transference. Let me explain. Language, we know, is an expression of thought in words. Everything we speak may be looked upon as a thought or a form of expression. And it is very difficult to divorce thought from form and *vice versa*. Here is a schoolroom story to show that form and function are inseparable. An inspector once asked a pupil whether this was a right sentence : "Boys,

was we in the school yesterday ? ” “ No sir,” came the prompt answer. “ Why ” ? “ Because you wasn’t, sir.” Thought is universal and therefore one would expect that some part of a language must be universal. And so, sure enough, it is. Indeed there are three distinct categories into which the grammatical study of a language falls.

(i) Universal : such as Subject and Predicate. Some grammars may not have been advanced so much as others and these distinctions may not be sharp enough but they *are* there all the same to the exact extent that the thought is there. For these universal categories are derived from thought itself.

(ii) Functional : such as the various functions of words, namely, parts of speech ; various modes of the verbs, we call moods ; different tenses ; the notion of singular and plural ; and the degrees of comparison. These appear to be as general as the universal, but really they are less so. For instance, singularity and plurality do not exhaust number in Arabic, where they have a dual number or صيغة ثنائية. So also while we have three degrees of comparison in English, we have only two in Arabic. Again in English there is no اسم آر as a part of speech.

(iii) The third category is formal. And it is this which belongs to one language and to no other, generally speaking. And it is in this that any conception transferred from Latin into English would be detrimental to the latter. To illustrate, the subject and verb in English, agree in number. Not so in Persian, where the neutral plural subject takes a singular verb to it. Again in Urdu, a change in the subject may change every other word in the sentence میرے لڑکے چلے گئے becomes میرا لڑکا چلا گیا. In English there is no other change but of number and even that is not a matter of inflexion. “ My boy went,” “ my boys went.”

Again take gender in English verbs and adjectives. It is significant in Latin, and for the matter of that in Urdu, but not at all in English. In Urdu لڑکی آئی, لڑکا آیا but in English “ the boy came ” and “ the girl came,” “ a good boy,” “ a good girl.”

It is worth while quoting here from the report of the Joint Committee on grammatical terminology (1910) in England. “ Recommended : that in English grammar the distinction of gender be not emphasised. Note : The objection to distinctions of gender in English is that they are (i) unnecessary and (ii) misleading. To call father masculine, mother feminine, table neither masculine nor feminine, leads to nothing in English Grammar ; for as there are no inflexions of gender in adjectives in modern English there is no agreement of adjective with its noun in gender and further to use the term masculine as denoting male, feminine as denoting female, and neuter as denoting neither male nor female, is to adopt a false definition of the term gender (sex and gender being two things). In German, Latin, French and

Greek, there is only a partial identity between masculine and male, feminine and female, neuter and neither male nor female ; nor is it true that the distinctions of gender in these languages are ultimately based on distinctions of sex."

I should like to make this point of wrong tranference clear by taking examples from the more familiar Arabic and Urdu grammars. And I must tell you in a word here that Urdu has shared the same fate as English in the matter of its grammar and has Arabic to thank for it. We have what is called *اسم آله* Arabic and when we see words of the form *منفعل* and *مفعول* i. e., *سطر، مثقال، مقلاب، مفتاح، مصباح، مقياس، ميزان، منقار، منظر، مقياس* and the like, we at once come to the conclusion that each one of these is the name of some instrument, whatever that instrument may be and whether or no we know its exact meaning. You can tell the very root it is derived from. The form is significant. It speaks. And now comes in the Urdu erudite grammarian and tell us gravely enough that *اسم آله* is *درانتی* and *اسم آله* is *متحرک* An excellent example of form and meaning having been confused. Then why not *اسم خوراک* is *سیب* and so on *ad nauseam* !

It is curious how *اسم آله* has escaped the omniscient eye of the Urdu grammar maker. For, surely, the literary mind that could call *اسم آله* *قلم، چاقو، قینچی* of *جانتے ہیں* a verb of dual number.

Case in nouns is another instance. I mean the subjective and objective cases, which are altogether indistinguishable unlike Latin nouns where these cases are known by special ending of nouns. You see such examples and pity the grammarians who have done the borrowing so poorly !

English is a language where form is very insignificant as witness these examples in *wire* and *cut*. "I *wired* him to come" "This is a copper *wire*", and "this is *wire* gauze." "If you *cut* some plaster and put it on the *cut* finger the *cut* will soon heal." The number of variables is very small. The invariables are many : adjectives and nouns are not inflected at all. This becomes obvious if we quote Urdu examples side by side with English ones.

A good boy (*اچھا لڑکا*) a good girl (*اچھی لڑکی*) good boys (*اچھے لڑکے*) good girls (*اچھی لڑکیاں*). In English whole sentences are sometimes invariable. "I asked him, 'How do you do?'" But "I asked him how he was", (in the indirect form of speech), not "how he did" as might be expected.

If therefore form does not help much in telling function how are we to know it at all? We know this by—

- (i) Inflexions.
- (ii) Word order.
- (iii) Stress or intonation.

I need not dwell on how inflexion shows function. This is too obvious to require explanation.

Examples of word order are added: (a) (i) I *naturally* read the letter (I read it and it was but natural I should, on receiving it).

(ii) I read the letter *naturally* (i. e., without any affectation in my tones).

The first *naturally* is used only incidentally almost parenthetically; the second takes the chief tone.

(b) (i) I failed *entirely* to understand it. (Did not understand it at all.)

(ii) I failed to *entirely* understand it. (It was only in part that I understood it).

For further illustration let us turn again to Urdu examples.

گدھے گدھا، رکے، رکا the form گدھا رکے کی طرف دھا and گدھے کی طرف رکے

are significant. But are they significant in “the boy ran towards the ass,” and “the ass ran towards the boy”? It is the word order which gives us function.

The third thing which shows function is sentence—stress or intonation. How important a part intonation plays in a living language which is composed primarily of sounds and only secondarily of letters which again stand for sounds, is borne out by the fact that the same sentence orthographically written, changes its meaning entirely with a shift of the nucleus tone or when intoned in a different way. And since English lives, chiefly at any rate by dint of being spoken and not of being written we have got to pause and think if we can afford to go the old pernicious way and draw a hard and fast line between spoken and written English. If in a living tongue, speaking is the chief thing, and writing, as Ben Jonson rightly said “an accident,” why not face the question squarely, shake off all undue nervousness and write spoken English? Why spoken English should be divested of its genial clothing the moment it goes into print beats all understanding. Perhaps a psychologist may explain the mystery. But for ordinary mortals it is enough to know that there is nothing to be ashamed of in spoken English, and we need not feel shaky in leaving this form permanently in print in its genial light, simple vein.

But this should not be understood to encourage or even countenance slang. For, by spoken English is meant, or I mean, that variety of English which is generally used by educated people (more especially in the south of England) in the course of ordinary conversation or when writing letters to intimate friends.

And then, you can always tell slang from ordinary literary English. Slang has a marked period of probation when it is unfit for literary use, but if it outlives that period, that is, if the majority of educated English people take to using it in ordinary every day speech it becomes *ipso facto* literary English and ceases to be slang. For we must never forget that the only criterion of correctness should be usage and not any preconceived, fixed dogmatic standard.

Stress and intonation must therefore be allowed for, even in written English. Only then is the whole meaning of the writer conveyed. Not that the written aspect is ignored but what is meant is, that in order to get at the whole meaning, written words must be spoken and properly intoned; written words, that is, must be looked upon as symbols for spoken words. And there certainly is mental speaking when we read or write.

And not only is this importance limited to sentences that are spoken. It has penetrated into the sacred domain of grammar itself. What I mean is that even in written English it is allowed for. For instance, the tendency to-day is even in written English to give 'only' a preverbal position in all cases, and not as of old, placing it before the word it modifies. Thus, He only died yesterday means "only yesterday," but the modern *precisian*, whose zeal outruns his discretion, is apt to chuckle ironically over it and say "he only died yesterday, as if he could have done more striking and final things." The risk of misunderstanding is but chimerical. The context should make it clear. And of course, in speech, there simply is no misunderstanding. The reason why we can here depart from the orthodox towards the natural is, in the first place, most educated people have used and still use it thus. In the second, this advancing of "only" is justified by the fact that such an advanced "only" makes the purport clear by removing the suspense at an earlier stage than by keeping it in reserve for the very word it modifies, especially in long sentences. This indeed may be looked upon as a positive triumph of the phonetician. And we are not very far from the day, I hope, when language teaching, especially foreign language teaching, will be considered quite inadequate without the aid of phonetics—a principle which is fully recognised abroad.

The last part of my paper deals with that most important aspect of a living language, namely, idioms and usage—usage which makes a language what it is and what no other language is. But true to my sceptical attitude towards the existing grammar, I shall not touch the usage that can look, and has been looking, after itself. I shall take up those much maligned usages that the well-meaning but ill-advised *precisian* has ever shunned as outcasts. I shall quote from standard living authors and add little comment. Only I shall ask you this: if all the good authors err, as the grammarian will fondly put it, hadn't we better leave

the solitary grammarian alone to his speculations and attend to the demands of the instinct and genius of the language trusting that usage can look after itself whether or not the grammarian warrants its use ?

(a) And first I shall take up the split infinitives. Just try the effect if they were not split in the examples that follow :—

- (i) You don't mean to *seriously suggest* that the German rode off. (*Conan Doyle*).
- (ii) To burgle this house is no more than *to forcibly* take his pocket book—an action in which you were prepared to aid me (*Ibid*).
- (iii) He ended a string of abuse by a vicious backhander which I failed *to entirely* avoid (*Ibid*).
- (iv) It will be obvious that any details which would help the reader *to exactly identify* the college or the criminal would be injudicious and offensive. (*Ibid*).
- (v) I was forced therefore *to seriously consider* the hypothesis that she had remained within the house. (*Ibid*).

If in the very face of the entire change of meaning in case we don't split the infinitives we are charged with the guilt of splitting them by no means let us feel ashamed of the guilt.

I shall next take up the modern superstition against putting a preposition at the end. The grammar books make no end of fuss about a preposition being a bad thing to end a sentence with, that by definition it should be put before the word it is related to. But the question naturally arises, why not change the definition if it has to be so faithfully stuck to rather than deprive English of a very flexible usage ?

- (a) A state of dejection such as they are absolute strangers *to*.
- (b) That depends on what they live *on*.
- (c) The less convincing on account of the party it came *from*.
- (d) The work was usually done by the Italians in the room we were *in*.
- (e) A criminal who was capable of such a thought is a man I should be proud to do business *with*.
- (f) The Indian I also thought nothing *of*.
- (g) He is surely the hinge the whole team turns *on*.
- (h) She was a lovely woman with a face that a man might die *for*.
- (i) The English notion of the French sportsman (right or wrong) is that he sports not because he likes sport, but because he likes the picturesque costumes it gives an excuse *for*.
- (j) An awful storm we think twice *about*.

This tendency to avoid the preposition at the end has gone so far as to result in clumsiness and incorrectness ; examples follow :—

“ The promised land for which he was to prepare but scarcely to enter ” instead of “ the promised land which he was to prepare for, but scarcely to enter.”

Things become yet more puzzling when the antecedent and the relative take the same preposition.

“ The great powers, after producing this absolutely certain result are ending with what they ought to have begun—coercion.” (*begun with.*)

“ Without troubling myself as to what such self-absorption might lead in the future.” (*lead to.*)

“ He chose to fancy that she was not suspicious of what all his acquaintances were perfectly aware.” (*aware of.*)

“ From his conversation I should have pronounced him to be fitted to excel in whatever walk of ambition he had chosen to exert his abilities.” (*abilities in.*)

But when all is said and done in favour of putting aside the superstition of avoiding the preposition at the end, the reform should not be allowed to become a fad, driving speakers and writers to the length of absurdities. We can say or rather should say, “ It was a knife I cut it with.” But to say, “ it was difficulty I cut it with,” instead of “ it was with difficulty that I cut it,” is simply absurd. In the former the preposition has come at the end of the defining clause, in the latter, the clause is in apposition with it and so should not have the preposition at the end. This may serve as a mark of distinction.

We are all aware of the abhorrence of the grammarian for the abbreviations, “ don’t ”, “ won’t ”, “ can’t ”, and the like. “ Don’t use them ” is the common, well meant but unsuitably worded advice given by Englishmen who are always anxious to teach *better* English than they themselves ever use in their speech. The out-caste “ get ” shares the same fate, Don’t say, “ I have got a pen ”, but ‘ I have a pen ’ and not ‘ I’ve got to go ’ but ‘ I have to go ’. And so the callous grammarian throws over-board, what we may aptly call a clinching or a fixing word.

“ And ” at the beginning of a sentence is another outcaste, And Wells has three such “ ands ” in the same passage.

Among the other sacrileges are “ it’s me ” and “ that’s him ” for the grammatical “ It’s I ” and “ that’s he ”. But can we very seriously ignore that it is through natural development that English has evolved its idiom and usage and that it is simply absurd for the grammarian to remodel it to suit his fancies. For to insist on calling a usage ungrammatical even after it has established itself is as much as to say that language is made for grammar and not grammar for language. It would not only be pedantic, but talking too much like a book.

It is not for me to say that grammar books should be stripped of all such inconsistencies. What I mean is that grammar books *do* need overhauling. And we must not only be alive to them but if we are to retain them all at we must be very sparing in pressing them into the service of language teaching. They have done more mischief than good. To an English student of English they may possibly mean something. Not that even there they help in teaching English but because they may equip the pupil for a future study of Latin. But of course any such excuse here in India is out of the question.

I am aware that I have offended against the orthodox grammatical taste and have given no constructive scheme. But I had my doubts and I have placed them before you in the hope that they may become your doubts as well. For you will admit that the first essential of any reform is for the mind to be awake to current defects and faults.

And, if I have succeeded in making you a trifle sceptical about much of what our popular grammar books have been telling us ; if I have set you thinking whether we had not better put an end to cramming the pupil's memory with some, at any rate, of the popular grammatical facts that do more harm than good ; if I have awakened the idea that in a living language like English, it is absolutely no use feeling shy of the usage which is the first thing to be reckoned with, and which being as it were an autocrat, it is no good keeping on bad terms with ; and that we can very ill afford to neglect the spoken aspect of English and the aid that phonetics alone can render in this regard, I shall not have taxed your patience and time for nothing.

TEXT-BOOKS IN HINDI IN SCHOOLS AND THE TEACHER.

BY PANDIT GAURI SHANKER, M.A., B.T.,

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Hindi or Urdu in the Punjab is to a certain extent a modern foreign language, Punjabi being the vernacular of the Province. To speak Punjabi is a birthright of every Punjabi while it is not essential that every Punjabi should talk in Hindi and Urdu or care to understand them. In this Province the linguistic problem is so very intricate and complex that it is not an easy matter to find a solution. Out of the total population of 25 millions and more, 15 millions speak Punjabi. In our homes we speak Punjabi or a dialect akin to it. Young scholars joining a school enter a world in which a host of tongues is used. In a High School boys read English, Urdu, Hindi, Punjabi, Sanskrit, Arabic and Persian. The instruction is imparted in Urdu or Hindi in certain subjects up to the middle standard, while in the High Department English usurps the place of nearly all.

The knowledge of the mother tongue, i. e., Punjabi which the child has so easily gained at home is made no use of in the school and he has to acquire a new medium of speech, i. e., Urdu or Hindi. These two languages which differ mainly in the choice of their vocabulary have their origin in common. While Hindi taps at the root of Sanskrit lexicography, Urdu enriches its vocabulary from the Arabic and Persian storehouse of words. To give an illustration, वह विद्यार्थी गणित विद्या प्राप्त करने के लिये प्रति दिन पाठशाला जाता है is Hindi while

وہ طالب علم ریاضی پڑھنے کے لئے روزمرہ مکتب جاتا ہے is Urdu.

The grammatical structure of the two languages remains the same. In the one the whole sentence is purely Indo-Aryan in its character while in the latter it is overlaid with semitic colouring. Thus my considerations on the text-books in Hindi will apply to Urdu also with certain modifications especially in the early stages where spelling in Urdu presents difficulties while Hindi is the most phonetic of all the scripts except the phonetic script itself. The script is different too ; in the one case it is a later form of Brahman characters and in Urdu the script is of semitic origin.

Then what place are we to assign to Hindi or Urdu in the Punjab schools ? It is said that they should be taught invariably for the following reasons : firstly, the possible lingua franca of the Indian Empire is Urdu or Hindi ; secondly, they cover a long range of time in the linguistic history of India. They have the history of India of the past centuries to tell. Thirdly, in the Punjab they are the practical medium of educated life. Fourthly, due to the lack of secular literature in Punjabi we cannot introduce Punjabi with much success in schools and colleges. Therefore we must have Urdu or Hindi.

Then should not Punjabi the mother tongue of every Punjabi Sikh, Muslim and Hindu be given any place in the linguistic attainments of boys and girls of the province ? They have rightful claims to insist upon having Punjabi as their vernacular, and to be used as the medium of instruction in every branch of Science. The indifference towards Punjabi is due to the pre-conceived ideas that Punjabi or Gurmukhi is the sole heritage of the Sikhs, as their scriptures are written in it ; while Hindus and Mohammadans have their scriptures in Sanskrit, Arabic, Persian, Hindi and Urdu. This indifference is more or less due to the fact that Punjabi is mostly written in Gurmukhi character.

Unfortunately Punjabi has not so far been accorded the respectable position of being used as a court language. The greatest responsibility rests on the Sikh rulers who in their times did not give Punjabi a place in their courts. That was a big blunder the consequences of which we are suffering and the generation to come will suffer at least for a century more. But the law of nature survives and we cannot check the current of Punjabi

which is gaining ground with great force. Literature in Punjabi is being enriched by the strenuous efforts of those who are devoted to its cause. Sikhs take the lead, while Muslims and Hindus are following their tread though slowly and hesitatingly. Let the three communities inhabiting the land of Five Rivers join hands and propagate the cause of their vernacular and marvellous results will be achieved.

This reference to Punjabi is made with the intention that the reader may note that we cannot consider Hindi or Urdu as the vernacular of the Province. In the school curriculum they do appear as vernaculars but it is a misnomer.

But in the circumstances we have to consider whether or not, side by side with the progress of Punjabi, we are to encourage the scholars in schools to learn Hindi and Urdu. For the reasons enumerated above Hindi or Urdu should be taught in schools with a fourfold aim, *i. e.*, we wish our pupils to speak Hindi, to understand it when spoken, to understand it when written, and to write Hindi. With these objects in view the text-books should be compiled. Speaking, understanding, reading, and writing in a language do not remain severely separate but each branch bears upon and co-operates with every other branch.

First then as regards speaking. Here our first and foremost requirement is ability to speak accurately and easily the ordinary Hindi and Urdu in daily conversation. The ability to speak implies the ability to understand it when spoken. Both these powers should be developed side by side.

Our third aim is that of understanding written Hindi. By written is meant both the Hindi of ordinary correspondence and Hindi in print. We must proceed to Literature through language. "To aim at literature is to miss the way to language. To aim at language is to pave the way to literature". (Wyatt). Familiarize the pupil with familiar Hindi all along. Lastly, the pupil on leaving the school in the high classes should be able to write Hindi of mediocre standard correctly in good style.

The power of expression in any language is a matter of skill rather than of knowledge. It is a power that grows by exercise, not by merely knowing meaning and rules. It is seen that boys even after passing their Matriculation Examination with Hindi cannot freely talk in Hindi, and if they do at all it is a heterogeneous mixture of Hindi, Punjabi and English. Right habits of speech in Hindi should be fostered from the very start. Otherwise it will be very difficult to undo those bad habits of speech which are once formed in the early days of learning a language.

The boys who take up Hindi must use that language in their class-rooms and outside also if possible. To be able to speak a language makes that language more living and real to a child

than to be able to read or write it. Many of those who speak Punjabi never write it. They have learnt it by speaking and retain its right use by speaking. No one ever learns the grammar of one's mother tongue at the time of acquiring it in childhood. By practice in speaking that language the child acquires it unknowingly. He becomes a master of it without reading or writing. Therefore, speaking Hindi should play a prominent part in the early days of its acquisition and that habit should be kept up in the later stages.

At present much stress is laid upon writing and reading in the Primary classes and less attention is paid to the speaking of Hindi. Thus students at the beginner's stage are handicapped and cannot speak the language accurately which fact alone tells upon their written work in the long run. Matriculation candidates commit such glaring blunders that it is hardly possible to account for them.

Next we come to the subject matter of readers :—Whatever we teach should be connected closely with the pupil's life all along, so that his interest may be kept up in his studies and that different branches of language teaching, *e.g.*, text, grammar, composition should co-operate and must not be separated with a wide gap in between. Early Hindi Readers in the Punjab should be confined to matters familiar to Punjab life, because the pupil needs to use Hindi as a means of communication in his Punjabi home and his Punjabi School.

In language the Reader in the middle stage should strike a mean between a language that is so bald as to lose all its Hindi flavour and Hindi that is so idiomatic as to present difficulties at every turn. But besides the introduction of new words equally necessary is the introduction of new common idioms and usages drawn from colloquial Hindi that serve equally well in speaking and writing. In current Primers and Readers in Hindi it is this latter element of the Hindi tongue that is commonly overlooked with the result that the pupil grows up unable to understand or to use common-place Hindi which is of the greatest use in ordinary talk and writing. Idiom is the soul of a language. Devoid of it literary elegance is impossible. Idiomatic use of the language shows the mastery of a writer over the language.

A warning should be uttered against the adoption of First Readers in which the selection of matter and language is determined by a phonetic principle so called, instead of by simple usefulness in the pupil's daily life. Such, for instance, is a type of Primer which begins with words फर, फन, फट, भट, भट, भस, भय, हम, हय, हर, हल, मन, नद, कतरन, करछल, शरमन, and so on. The stuff, above all, must be such as the pupil would himself actually think out, the ideas must

be ideas ordinarily coming into his mind, and not language and matter especially conjured up in the mind of the writer of the Primer for the occasion.

The essential features of a good reader are a selection of suitable, useful, and usable vocabulary, a gradual increase in its extent, and development in usage and construction, and a sufficient continuity in its passages and variety of topic to provide interest to the pupil and all the vocabulary needed.

The aim in teaching Hindi is not achieved if the teacher does most of the talking himself and pupils sit as silent listeners in. In a language lesson the pupils must be learning language all the time, getting used to it rightly by themselves.

Living as we do in a utilitarian age we must derive utility out of everything and grammar does not escape the rule. The teacher need never trouble his pupils with a knowledge of grammar rules so long as that pupil can read, write, speak, and understand Hindi without it. Teach grammar incidentally and only when required to understand Hindi.

Before the high stage no text-book should be necessary. In grammar we must begin with the teacher and end with the text-book. Readers contain enough grammatical matter for practice, and rules which are important enough for the pupil to learn are also important enough for them to take down in writing. Moreover, the good teacher does not need a text-book for his pupils, for he can pick the grammar to be taught to them from his own book of reference. Thus pupils will prepare a book of reference in grammar for themselves by themselves.

The lazy teacher resorts to a grammar book to replace his own teaching, and the unqualified teacher is misled by a book on Grammar in Hindi into following its treatment or order without discrimination. In the high stage a suitable book may serve the pupil for reference. He should then be at a stage where he can use or learn to use a book of reference for himself with advantage.

As remarked before, we must lead the pupils to literature through language. The teaching of literature means the introduction of the pupil to the best in thought and expression in language, his appreciation of the nobility and beauty of what he reads, and the cultivation of his power of appreciation to a higher degree. What he reads must touch his life. 'Literature is an introduction to the soul of man through the medium of words. A distaste for literature is a contradiction in terms, for literature is delightful and presented in delightful words.' (Wyatt).

The chief difficulty of teaching literature in schools is the teacher's difficulty of appreciating literature himself and interpreting it in the terms of his pupils. This task must be entrusted

to an efficient teacher otherwise even the best text-book will fail in its aim and a distaste for Hindi literature in Punjabi boys will be the outcome.

The cursory readers which are suggested for extensive reading must contain interesting topics presented in charming language. They may contain easy poems in Hindi of good poetic value.

To conclude, the requisites of a good text-book in any subject are applicable to Hindi text-books as well. It should be clearly printed in type of suitable size on good paper; it should be strongly bound; its statements should at least be accurate; its language should be easily comprehensible to the pupil and if illustrations are given, they should do what they profess to do, namely, throw light on the text.

Whether a text-book is best written by a first rate authority on the subject or compiled by an experienced teacher from authoritative sources is a question upon which no general rule can properly be laid down. When the same person combines in himself mastery of the subject with skill in expounding it to a beginner the text-book written by him is sure to win its way to a wide acceptance. But even a text-book possessed of the above good qualities placed in the hands of an inefficient teacher is sure to be a failure, for the maxim is "Begin with the teacher and end with the text-book."

STUDY OF SANSKRIT LITERATURE IN SCHOOLS.

BY DR. LAKSHMAN SARUP, M.A., PH. D.,

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If we make a brief survey of the history of Sanskrit studies, we find that the last 100 years have brought about a revolution in its domain. It has been a very bloodless revolution, silent, gradual, almost imperceptible but it has pursued its course steadily till it has gathered such strength that the effect of its cumulative force can no longer be ignored.

From the early dawn of history, Sanskrit studies have been mainly confined to the priestly circles, i. e., the Brahmanas. Theirs has been the most important contribution to Sanskrit literature and ever since they have been its chief custodians. In course of time, the Brahmanas were successful in establishing an intellectual hegemony of their own. As their leadership was unchallenged, they gradually began to exclude other classes from participation in Sanskrit studies. The Sudras were the first to be so excluded. Then came the turn of the Vaisyas and the Kshatryas. In the beginning this exclusion was confined to the

Vedic studies only but in course of time the process was extended and all Sanskrit studies, whether Vedic and classical, were closed for all non-Brahmanas. It is true that all twice-born men are enjoined to study the Veda but during the past millennium, this remained a mere injunction. The more conscientious among the other two upper classes performed the duty of studying the Veda by proxy and the Brahmanas were deputed for the performance. Thus Sanskrit studies became the sole monopoly and the close preserve of the priestly classes. This was not all. Another step and a bolder step was taken. The ancient right of the other two upper classes, the right to study the Veda, was itself attacked. The Brahmanas refused to teach the Veda or, as a matter of fact, the classical Sanskrit even to the Kshtryas and the Vaisyas. Thus the exclusion of non-Brahmanas was complete. This conservatism reached its zenith during the past two centuries. Even in the beginning of the 20th century orthodox Pandits did not allow non-Brahmanas to attend their class. In this connection I shall cite one case, which happened in 1907 in the town of Muttra. There was a famous Pandita, a teacher in a local private *pāthasālā*. A boy who had a great desire to study Sanskrit presented himself one day before him with the usual offerings of fruits and sweetmeats. He smiled and seemed pleased and admitted the boy into the class. At that time he was teaching *Raghuvansā*, the well-known poem of Kālidāsa. Two weeks passed. Then suddenly he received a wireless message from some local indigenous, C.I.D. department that a non-Brahmana had been admitted into the *Pāthasālā* and so the boy was ignominiously expelled from the hierarchy of Sanskrit students. I know this case well because the boy who so expelled was myself. In this way Sanskrit studies came to be entirely confined to the Brahmana circles.

There was another aspect also. As the studies became confined to the priestly classes, a religious character was imparted to linguistic and literary studies. Grammar was studied not because it enabled one to use the language correctly but because it brought some spiritual benefit. Similar ideas were applied to literature. Thus a man will obtain a son if he studies the *Harivansa*, a supplement to the great epic *Mahābhārata*. His wife will become barren if he reads the 1st canto of *Raghuvansa*, a poem of Kālidāsa. He will die a premature death if he goes through the VIIIth canto of the *Kumāra-Sambhava*, another poem of Kālidāsa and so on. In this way temporal studies were confounded with spiritual studies and literature was mixed up with superstition.

With the introduction of Sanskrit into Europe, non-Brahmanas began an earnest study of the language and literature of Sanskrit. Not only was the long and firmly established monopoly of the Brahmanas broken but their leadership and intellectual supremacy were questioned and their interpretation of Indian

thought and culture were challenged. Never before in the history of Sanskrit studies, had non-Brahmanas seriously taken up the study of the Veda, much less had given an interpretation of their own which interpretation was radically different from that of the priests.

Again new channels of literary activities were opened. Ancient chronology was built, ancient inscriptions were deciphered, and the ancient political history was pieced together. All this activity gave a severe blow to the prestige and the authority of the priests.

Further the character of the secular studies was restored to its right place. Superstition was banished from the domain of literature. Scholars were no longer afraid of a premature death in boldly studying the 8th canto of the *Kumāra-Sambhava*. On the one hand the placidity of blind belief was broken, on the other a sane spirit of criticism was introduced. And what is more, even the sacred scriptures were no longer studied in a religious atmosphere of faith and devotion. Parts of the Vedas are prescribed in the M.A. course in Sanskrit in practically every modern University. The object is not to obtain any spiritual benefit but to make a critical and comparative study from the linguistic and literary point of view. Even the Rig Veda is interpreted in the light of comparison and is subjected to the fire of criticism.

Our worthy President told us, in his eloquent address the other day, how Sanskrit came to be included as a subject in the curriculum of the modern school. One important result of making Sanskrit a subject of study in the modern school was that in India herself, non-Brahmanas have re-acquired their lost privilege of studying Sanskrit. Kshatriya, Vaisya, even Sūdra boys are now no longer refused admission to the Sanskrit class. This has broadened the basis of Sanskrit studies. The appeal is now made to a much wider circle. In this way a revolution has taken place in the domain of Sanskrit studies both externally and internally. Externally, because Sanskrit studies are no longer the close preserve of priestly classes, are thrown open to all irrespective of caste, and are earnestly undertaken across the seas. Internally, because the character of Sanskrit studies is entirely changed. It is neither religious nor superstitious but literary, critical and comparative. The authority is replaced by a sane and scientific spirit. This is the revolution which I mentioned in the beginning of my paper. This revolution has produced a phenomenon which I would like to describe as the secularisation of Sanskrit studies.

Although the priestly classes have lost their hegemony of scholarship, they have still preserved their hegemony of teaching. A vast majority of Sanskrit teachers in our schools is recruited from the Brahmanical community. This produces a strange contrast. We have the modern school, surcharged with the

atmosphere of the new emancipation, wherein the spirit is mainly secular, scientific, and critical. And we have the Sanskrit teacher who is mediæval in outlook, orthodox in his views and dogmatic in his study. In his case, evidence is replaced by authority and criticism by faith. This bringing together of the modern and mediæval spirit in one and the same place has not worked harmoniously. There has been a stifling of spirit as far as Sanskrit studies are concerned. The study itself has become too wooden. There is a mechanical repetition of text and translation *ad infinitum*. It does not mean any mental discipline. The young student is encouraged to commit the text with translation to memory and the whole thing is mechanically reproduced in the examination hall. The study is absolutely lifeless. It is a mere form and a fossilised form.

Even the vernacular translation from Sanskrit is not done in a proper manner. If rightly done, it can serve as an excellent training for the mind of the young student. When a particular stanza is taught in the class, the teacher does not bother himself with each individual word. He merely tells the sense of the stanza to the student. Very often, it is dictated. The student commits the sense to memory and when passages are set for translation in examination, he reproduces the sense which he had committed to memory beforehand. He is quite ignorant of the meaning of individual words. And if one or two words of a stanza which he has studied in the class, reoccur in a different stanza, he is at once floored. The mechanical reproduction of the sense in the answer-paper very often enables him to pass examinations one after another but his knowledge of the literature or as a matter of fact of the language is almost negligible. This type of student is very common. I have met him even in the honours school in Sanskrit, where after passing the F. A. examination in Sanskrit, a young man did not know whether a particular word was in the singular or the plural number or whether the case was instrumental or ablative.

This mechanical reproduction often results in comedies or should I call them tragedies. It so happens that two stanzas, say A and B, begin with an identical word or phrase. A student has committed the sense of stanza A to memory while stanza B is set in the examination. As the opening phrase is identical the student mistakes B for A and reproduces from his memory the sense of A in the blissful ignorance that A is entirely different from B.

Again the sense of the stanzas given by the teacher is not translation. It is a parody of translation. It is a very loose performance. Neither is the original closely adhered to nor is it accurately expressed. No effort is made at precision. That shows the lack of training and the effect is seen in many of the published translations in the vernacular. You will realise the difference

at once if you take the trouble of comparing the vernacular translations of Sanskrit authors with the English, French, or German translations of the same authors. Or see the English, French, or German translations of Greek and Latin writers. As compared with these, our vernacular translations are called translations as a matter of courtesy only. Very little training is given in our schools in the right methods of translation and the result is this deplorable state of affairs. A translation should be the next best substitute for the original. It should produce the same effect or almost the same effect as that produced by the perusal of the original. The translation should be as if the original author had himself written in the language in which the translation is being made. A translator has no right to take liberties with the text of the original. He should therefore be absolutely faithful to the text. His fidelity should be unimpeachable. But that is not all. While adhering faithfully to the text, he should not lose sight of the spirit of the original author. All the qualities as well as the faults of the original should be reproduced in the translation. If a particular passage of the original is eloquent, the translation of that passage should be equally eloquent. If the original is satiric, the translation should clearly convey the satire. If it is humorous, the humour should be mirrored in the translation. Not only the spirit in its entirety is to be reflected in the translation but some indication of the style as well is to be given. It should convey a distinct impression of the simple or stiff, natural or artificial, elegant or elaborate, graceful or bombastic style as the case may be. If this ideal of translation is reduced to practice as it has been in the Western countries, translation itself will be a great gymnasium for the training of the mind.

Moreover a good many text-books prescribed in our schools in Sanskrit are haphazard compilations without any plan or systematic arrangement. The course should be so designed that it should lead a student from one class to another with an easy gradation of difficulties till a reasonable standard is reached at the Matriculation stage. Again when classic text like the *Rāmāyana*, the *Panchtantra* or the *Itiupadesā* are prescribed students should be given some information about the authors, their work, and the particular text prescribed. I do not mean to say that the mind of a young student should be stuffed with an elaborate discussion of the different recensions of a particular text or the various readings of a particular word but some general information about the author and his work in a popular form is desirable, in order to whet his curiosity and to instil into him a spirit of appreciation of the beauty of literature which he has to read. In other words, the study of literature should not be a mere string of words and their meaning but a culture of the heart. The study of literature should afford the training of the mind on the one hand and the culture of the heart on the other. To recapitulate and suggest reform in three directions.

Firstly, better text-books are needed. They should be designed on a common plan, with easy graduations of difficulties and arranged on a historical basis. Secondly, a better quality of translation is essential if the study is meant to impart mental training. Literature should be so studied that the training of the mind is harmoniously combined with the culture of the heart. And lastly, what is far more important the mediæval methods should be discarded and the modern spirit should be introduced in the study of classical languages. That means, that a better type of teacher is indispensable to vitalise the study of the classical languages.

But a better type of teacher cannot be forthcoming unless the attitude of the Education Department is radically changed. Up till now the classical languages have received a step-motherly treatment at the hands of the Education Department. The classical teacher is the lowest and the least paid in the whole school. He is consequently looked down upon as an inferior being by his colleagues. A definitely lower status is assigned to him. The hall-mark of inferiority is thus placed on a classical teacher by the Education Department.

This inferiority is not confined to schools only. It is also observed in the higher regions of the Educational Service. There is a Professor for every subject in the Government College, Lahore, but only a Lecturer for classical languages. This subordinate status of classical language is peculiar to the Punjab only. In every other province, the study of classical language is on a footing of equality with other subjects. This is shown by the fact that in every other province there has been more than one I. E. S. post for classical languages for a long time.

It is not merely an economic problem. The result of this lower status of classical language is that first class minds in the University do not take up the higher studies of classical languages. There is no prospect before them. When a young man finds that however brilliant his University career may be, whatever academic distinctions he may achieve, however important may be his contribution to research, all that he can look forward is the lower subordinate service in the Education Department and if he lives long enough, and is lucky enough, he may rise to be a Lecturer in the Government College, Lahore, while in every other subject some distinction is enough to take him in the P. E. S., even the higher service, and there is the possibility of his becoming the Director of Public Instruction. When the contrast is so striking a young man will think twice before he takes up the higher study of classical languages. The present conditions of service are such that a first class mind is very much discouraged from the pursuit of higher studies in classical languages. As long as brilliant young men do not come forward to take up the study of classical languages the study is bound to remain in its present fossilised form. Latin was studied throughout the Middle Ages

but it never produced the Renaissance Movement. It was only when first class minds took up the study of Greek and Latin that we see a new life spring up and we see the birth of Renaissance Movement. These brilliant young men will not be forthcoming till the attitude of the Education Department is radically changed and the hall-mark of inferiority is removed from classical education.

STUDY OF SANSKRIT IN SCHOOLS.

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Results of the present system of teaching Sanskrit in our schools and colleges have been far from satisfactory. We have failed to create any interest in our young men for the study of Sanskrit literature. At the Matriculation stage, a candidate knows little of Sanskrit and even when a graduate in the subject he cannot study independently such simple works as the epics, Bhagavadgita, Upanishads, or the dramas of Bhasa and Kalidasa. If an examiner in Sanskrit dare express his genuine feelings, his narrative, though commonplace to his colleagues, would be distressing and disappointing to the general public. He would begin with a strange paradox that though the percentage of passes in the last few years shows a marked increase, the standard of efficiency is rapidly deteriorating. Somehow we have formed an impression that in order to attract a larger number, we should let pass as many as possible. Most of the candidates now take up Sanskrit because they feel pretty sure to get through in that subject with comparative ease. Let them cram translations of important verses and a few declensions and pour them out on the appointed day and they can obtain an entrance passport.

This is no occasion to present a detailed report on examinations but a few striking instances of general inefficiency may not be out of place.

In the M. S. L. C. Examination, 1926, Sanskrit Paper (a), one of the questions required the candidates to give rules for the change of dental *s* and *ṣ* to cerebral *ś* and *ṣ* respectively. These changes are so well known, so important, and so frequently used that one could reasonably expect every beginner to be thoroughly familiar with these. As a matter of fact, out of a lot of 468 answer-books, only three gave correct answers. This record of efficiency was bad enough but it was shocking to find quite a number of candidates for the Bachelor's Degree ignorant of the declension of Rāma, the first lesson in Sanskrit grammar taught in middle classes. Even with most lenient standard of marking, examiners find it impossible to award even one out of 30

or 40 marks, in translation to many students—sometimes about ten per cent. get a zero. Such being the case, is it not ridiculous to talk about standard of efficiency? Are not the examinations a farce? Do we give the question the attention it deserves? Are we not deceiving ourselves and deceiving others by closing our eyes to actual facts?

To me it appears that few, if any, are serious about the teaching of classical languages. The problem centres round one question—What is the position of Sanskrit in education in modern India? It will be admitted by most of us that we cannot discard altogether the study of Sanskrit in this formative period of New India. The last century has witnessed a great literary renaissance in India. The labours of oriental scholars have revealed to us an astonishing wealth of Sanskrit literature. It is the priceless record of a great civilisation and in it we can find the whole synthesis of Indian life and thought. It presents to us a true and vivid picture of our great past and its study may well be helpful in the realisation of a greater future. In the task of national regeneration, this great literature should form a solid foundation. It is a fascinating and stimulating study so rich in achievement and so pregnant in inspiration—an age when thought and genius of the Aryans found its full expression. This literature is a great heritage of ours and we are intimately bound to it.

Such is the importance of Sanskrit studies. But strange as it may seem, they are bound to die out much sooner than most of us imagine if they are treated as lightly as they are at present. The old type of Sanskritist is fast dying out. Our ancient universities hallowed by the brilliant associations of thousands of years have been long deserted. For centuries they have been the haunts of snakes, bats, and owls. Modern representatives of the intellectual aristocracy of ancient India are now ridiculed as the 'Pandit class'—ridiculed rightly to some extent, for they are custodians only of the latent decadent phase of our literature representing intellectual degradation of a culture too long confined within itself and deprived of the stimulant of new ideas and unable to readjust itself to changing conditions. Their modern academic centres have long stultified themselves with hair-splitting dialectics. And even this wreck of a great class is fast dwindling for want of sufficient encouragement and because it has no market value.

On the other hand, our new universities have so far failed to create any living interest in the study of Sanskrit. Unfortunately, the tendency throughout has been to make classical language a reserved subject for the antiquarian and orientalist. No effort has been made to impress upon the people the intrinsic value of the study of Sanskrit. No doubt a considerable stimulus to Sanskrit learning was given in North India

by the Arya Samaj in its earlier years. But the zeal has long subsided, mainly because it was chained by strong prejudices to a highly unpractical and wasteful system of grammar. It may have resulted in a general reverence for Sanskrit but has failed to evoke any real enthusiasm. In fact, we have yet to realise that the study of Sanskrit literature is to us not a subject of academic interest only but a living thing, the very foundation of our national culture and existence.

Then, again, we have to realise that in spite of its great importance, classical languages can claim only a third place in our study of languages—the first two places being necessarily reserved for Vernacular and English. Whatever the sincerity of our zeal we can never afford to give it more time in the daily routine of our schools and colleges than we are giving at present. Thus we must clearly note that classical languages are getting the maximum time they can reasonably claim and efforts for improvement can be directed only towards the efficiency of teachers, teaching methods, and text-books.

The aim before teachers of Sanskrit should be—

(1) That their pupils appreciate the importance of Sanskrit, should cultivate a passion for its study which should last long after student life.

(2) That their knowledge however limited in its scope should be so sound that in later life it may form a firm foundation for self-study with the help of translations, commentaries, and reference books. I for one would feel perfectly satisfied if a candidate for Matriculation could understand a text much simpler than Hitopadesá or easy passages from Valmiki provided he is able to analyse the simple forms of grammar with ease and facility. A graduate should certainly be able to study independently easy Vedic texts like Upanishads. He should be able to appreciate the works of Valmiki and Vyasa, Bhavabhui and Kalidasa and classical literature (excepting of course the difficult Kavyas and prose romance).

I believe this standard can be achieved. We can simplify the task of both the students and teachers to a great extent. But all this requires patient intelligent work, long and continuous labour on scientific lines by competent scholars. It will necessarily take generations, but let us be earnest about a good beginning. It is, of course, for the Government and the public to encourage such work by providing suitable attractions for the capable workers.

I do not attach much importance to the valuable research work that is being carried on by distinguished scholars in various Indian universities, for I feel that by neglecting primary work of adapting Sanskrit to modern methods, they are cutting at the very root of Sanskrit studies and of their own existence.

I beg to offer a few concrete suggestions below :—

My first suggestion is of a highly controversial nature. I believe that Paninian Convention must be immediately set aside. I stand second to none in my admiration for this wonderful grammarian but I think in our present circumstances, teaching along Paninian lines is a stupendous waste of national energy, and that the sooner we discard it, the better for us. It is a drastic suggestion no doubt and many among my teachers, friends, and colleagues may laugh at it. To them Panini is the soul of Sanskrit—Aṣṭadhyaī the only gateway to its literature. My contention is that it may be a good substitute of Euclid for intellectual gymnastics but at present as a system of grammar in schools and colleges it is hopeless. Panini composed his historic work in the age of Sūtras, in good old days when memory was the only vehicle of all learning. Ours is an age of reference of libraries. Again in our daily school routine, we can afford to give at a maximum one period to classical language. At Benares, a student devotes ten or twelve years to master Aṣṭadhyaī, though devoting his whole-time energies to it. Grammar is only a means to an end but our orthodox system has made it an end in itself. We cannot give it even a fraction of the time that Benares pupils give and so we cannot follow the system, however perfect it may be, with any advantage. Panini may well remain a useful reference book for the research man and the specialist, but it cannot become a text-book for a general student who has to learn half-a-dozen subjects side by side with a classical language.

Even mediæval India made many efforts to improve upon the method of Panini. Bhattoji Dikṣit followed an important line but though it does not lessen the strain on memory, it is devoid of the additional advantage of the training of intellect with which Panini was associated. Efforts of non-Paninian schools resulted in various systems like that of Kalantatra Muḡhḍhabodha, etc., but unfortunately, few, if any, in our province are acquainted with these.

Max Muller, Whitney, Macdonell and other scholars have tried to bring Sanskrit Grammar into line with modern methods. Following the system of Panini in the main, they have been fairly successful in simplifying and modernising it. Prof. Macdonell's Sanskrit Grammar for Beginners is an admirable handbook. I find it the best book on the subject and I am sorry our teachers and professors do not follow it. The treatment is so perfect, so methodical and so intelligible that other books used in our colleges stand no comparison with it.

While speaking on the Paninian convention, I may also note that in this direction there has been a definite set-back in our province during the last few years. Paninian terminology

which was absent from text-books of grammar eight or nine years back has been fully re-introduced.

II. My second suggestion is—Let the student know less, but let him know it thoroughly. I offer my strongest protest against the present practice. For Matriculation we have prescribed text-books for grammar which contain materials certainly enough for a B. A. or even M. A. student, books which teachers cannot teach, and the students cannot understand. The result is a hopeless neglect of grammar and mere cramming of some forms. I cannot understand why we should place in the hands of a Matric boy a manual of grammar of the B.A. standard. Why should he not know definitely the standard he is expected to reach ?

III. My third suggestion is that while teaching Sanskrit we should not ignore the connection of our vernacular, Panjabi, with Sanskrit, especially in the earliest stage. In the first stage, we should carefully select a vocabulary of Sanskrit words and roots which have their direct representatives in Panjabi so that the young beginner may find himself familiar with these. In our elementary text-book we should prefer the use of **वा** to **भ**, **जल** to **वारि**, **हर** to **पाणी** and so on. No one has so far tried to work upon this idea but I am sure if we give more attention to the connection of the Panjabi with Sanskrit, valuable results can be obtained and our system of teaching in the school stage can be made more interesting and simple.

IV. My fourth suggestion is that in our text-books, there should be a scientific gradation. At present we begin with haphazard selections in the middle classes. *Rijuputha* may be easier than *Hitopadesa* but it cannot be used as a scientific beginning. In our province, so far as I know, the only attempt to introduce some sort of system in our middle stage has been that of late Pt. Daulat Ram. But frankly the scope for improvement remains unlimited.

V. My fifth and last suggestion is that the teacher should try to combine the teaching of grammar and text, so much divorced from each other at present. The compositional part may thus form an essential auxiliary of grammars and grammatical analysis of typical form should invariably be given in the notes at the end of the text-book. Books of the late Sir Bhandarkar have been very popular in our parts but I find in **याकरणोपक्रमणिका** of Ishvara Chandra Vidasagar a much better treatment of the subject. No scholar since then has devoted his attention to the subject and the result is that we are where Bhandarkar and Vidyasagar left us.

A well-known educationist of our province used to say that the defect in our national character was the domination of an absolute inertia—an entire lack of progress—an

antithesis of the old Aryan character, so full of life and vigour, so thirsty after progress, so ready to adapt itself to changing conditions. Our mothers use still the same spinning wheel which was used in the Vedic age, our cultivators use the same rough plough used by our ancestors of neolithic age, and our teachers of Sanskrit use the same old method employed by teachers of seventh century when Itsing visited our country. In the end let me repeat what Dr. Sarup said yesterday—let us now discard mediæval methods of teaching.

THE TEACHING OF SANSKRIT GRAMMAR.

PLAN OF A LESSON ON THE PERFECT TENSE IN SANSKRIT.

By Mr. Bishen Das Puri, M.A., Principal, Government Intermediate College, Dharmasala.

I. The pupils know what the perfect tense means from their knowledge of English grammar. Tell them that they will begin the Perfect, (they have read the present and imperfect). Show its functions by examples.

II. Questions on the terminations of the present tense in the second group of conjugations (Atmane Pada).

Replace त् and ते by ए and इरे and you get the terminations of the perfect tense. Let the pupils take down both the sets side by side.

III. Now give the Parasmai Pada terminations. Ask the pupils to contrast them with Atmane Pada ones and help their memory by points of resemblance and difference. Let them note both.

IV. Question on the rules of reduplication they have already learnt and tell them that these rules apply to the perfect tense as regards the initial letter of the root.

V. Ask them to conjugate the root कृ in the perfect tense (Parasmai as well as the Atmane Pada).

VI. Refer to the text-book (Bhandarkar's 2nd Book of Sanskrit) about the change of धृ into वृहृ.

VII. Now take the root वृध् and let the pupils conjugate it. Draw their attention to वृवृधिन्, वृवृधिम etc.

VIII. Introduce the terms सेट् and अनिट्; and refer to the text-book, page 80.

IX. Name the eight roots capable of taking इट् (text-book, page 79).

X. Then turn to the exercises. Take each verbal form in turn. Let it be parsed. This done, discuss the construction of each; and educe from the pupils the grammatical peculiarities, if any, of these forms.

XI. Let the pupils account for the exceptions by referring to the instructions given in the text-book and quote the paragraphs in the note-book.

XII. Ask the pupils to translate at home the first 10 sentences out of the English exercises into Sanskrit. (To be corrected by the teacher the next day in the Sanskrit period).

A glance at the successive stages in the above plan will show that I have tried to combine the old and the new method. The following principles underlie the method outlined by me :—

1. Always connect the new knowledge with the old. Compare and contrast on all possible occasions.

2. Take, first of all, general rules only and teach them by application.

3. Let the pupils find out and account for the exceptions (as illustrated in the exercises) under the guidance and with the help, if necessary, of the teacher.

4. The text-book can be referred to, with advantage, for the verification and confirmation of the knowledge thus acquired.

5. After all the Sanskrit exercises have been gone through in this way, the pupils should be asked to frame sentences of their own, using the new forms learnt by them.

6. The English sentences following the exercises in Sanskrit may be translated by the students at home where they have ample time to think over the subject.

7. Errors of the pupils had better be corrected in their presence by the teacher.

8. The correct forms should be read aloud by the pupils ; sometimes several times. They will be thus easily impressed on the pupils' minds.

9. Each pupil should have a note-book, in which should be written, in order, all the general rules, exceptions and exercises as they are taken up in the course of instruction.

10. The boys should be urged to frequently consult the vocabulary given at the end of each lesson and the general glossary at the end of the book.

THE RENAISSANCE OF URDU POETRY.

Origin of Urdu Language.—Urdu or Hindustani took its birth in the accident of intercourse between the natives of India and their foreign conquerors. The conquerors, though politically alien, were of Eastern origin. Whether Afghan or Turkman, they were Asiatics. Majority of them lived and died in India. Social intercourse, business transactions and governmental work were impossible to carry on without understanding the language of each other. The incorporation of the vigorous and victorious Muslims with the cultured and subjugated Hindus inevitably resulted in an alternation of action and re-action of all the causes included in it ; for it may be assumed as an historical truth that no nation or religion can conquer any other without being influenced in several matters by the culture of the conquered

nation. If Hindus took up the study of Persian, Muslims were not remiss in the study of Sanskrit and Hindi. The famous Alberuni was the first to study Sanskrit. As to Hindi Amir Khusro, Mulla Dáúd, Khán Khanan Abdur Rahim and Malik Mohammad Jayasi are prominent figures in the history of Hindi literature. The linguistic situation in Northern India on the eve of the Muslim conquest from the North-West passage was something like this. The chief of the secondary Prakrits were the Magadhi of Bihar, the Ardha-Magadhi of Oudh and Baghel Khand and the Saurseni of the district round Muttra and the plains of the Punjab. Their latest stage was the series of dialects called *Apabhransa*, which gave birth to sturdy offsprings, the modern Indo-Aryan vernaculars or Tertiary Prakrits. About the tenth century from Sourseni Apabhransa there sprang what we call Western Hindi and Punjabi. I need not follow the course that the growth of Modern Northern Bhashas took, suffice it to say that both the Hindis, *i. e.*, Western and Eastern, as well as the Punjabi took their rise in Saurseni Apabhransa which belonged to the Punjab proper and the Province of Agra of the early nineteenth century; of course including Delhi, and crystallising indifferent languages now known as Brijbhascea, *Lehnda*, Punjabi, and so on.

Therefore the languages or dialects used in early epochs of Muslim conquest in transacting state affairs and business matters must have been something like Chinese *patois* and may be called *pidgin* Hindustani. It appears that when Hindus undertook the study and use of Persian, which was and had been the court language of India throughout the Muslim supremacy, and Muslims to that of Sourseni Bhasa, generally known as Hindi, a workable *via media* was brought about and Hindustani or Rekhta, as it is known to us, took its origin in that cultural compromise of the two nations, or let me say the nation, as both the classes were only religiously apart while politically one people.

Origin of Urdu Poetry.—It is a trite saying that every language begins with poetry. As language, it is an admitted fact, Rekhta or Urdu had its beginning in poetry. The reason is obvious, both Hindi and Persian being rich in poetry, no other product of their union could be anticipated than Rekhta or Urdu poetry. It must be noticed that I have not made any mention of Dakhni mixture in our early Urdu or its poetry, because its appearance in the Rekhta of the time was simply episodic and therefore insignificant. Here I may be excused for a short digression.

Deccani Theory.—I feel constrained to say that there are some people who shut their eyes to the solid facts of the history of India while discussing the origin of Urdu poetry. They are either misinformed or pragmatic and unwilling to see where the right material for research lies. Some recent works treating

the subject are disappointingly misleading. One is left in bewilderment as to how it came to pass that although the home of Amir Khusto and Baba Nanak and Shah Nazeer, Urdu poetry should have gone all the way to Deccan to take its birth and rise and as to why some Deccani words and idioms can be traced in the composition of almost all Mohammad Shahi poets of Delhi. This important problem would have been easily solved had the history of pre-Mughal India been consulted. History furnishes us with a series of facts which throw a flood of light on this subject.

During the reign of King Mohammad of the Tughlak dynasty, Delhi more than once was, so to speak, transplanted in Deccan. Mohammad Tughlak reigned from 1325 to 1351 A.D. With all his learning in science, philosophy and literature he was a freak of nature. All his accomplishments, various indeed as they were, were marred by a perversion of judgment and a ferocious temperament. He had a fancy for Deogiri in the Deccan, which he christened Daulatabad and desired to make it the capital of India. And the poor Delhi people were made, on pain of death, to quit their home and emigrate to Daulatabad. Says Ferishta :—

” حکم فرمود کہ دہلی را کہ رشکِ مصر بود -
 خراب کرده و خلقِ آنجا را کہ از صغیر و
 کبیر و نوکر و غیر نوکر و از مٹوٹ و مذکر
 کو چانیدہ بہ دیوگر آوردند و منوطن سازند -
 و از بس تغیر و تبدیل کہ بہ احوال
 مردم راہ یافت - تفرقہٴ عظیم در کارِ ملک پدید
 آمد و خرد و بزرگِ دہلی آمدہ در دولت آباد
 ساکن شدند - دہلی بنوعی ویران گشت -
 کہ آوازِ بیچ متنفّسے بجز شغال و روباہ و
 جانورانِ صحرائی بہ گوشِ نئے رسید + ”

It was during one of these emigrations from Delhi to Daulatabad almost amounting to evacuation of Delhi that Ibn Batuta visited the doomed capital in A. D. 1341. In his account of travels he describes Delhi as a most magnificent city, but although the king was repeopling it, it was almost a desert. “The greatest city in the world”, he writes, “had the fewest inhabitants.”

The forced emigration of the people from Delhi to Daulatabad took place at least twice. It appears that return from Deccan to Delhi was only permissive. The wretched condition of the people can be easily imagined. Many of them weary of these emigrations decided to settle down in Daulatabad. Thus Ferishta on this point :—

و فرماں داد کہ از مردم دہلی ہر کس کہ در دولت آباد
ساکن است۔ اگر خواهد بہ دہلی بیاید و اگر در دولت آباد
خوش کند آن جا باشد۔ پس اکثر بہ ہمراہی بادشاہ
از دولت آباد بہ دہلی آمدند۔ و جمعے ولایت مرہٹ
را خوش کردند۔

Now it can safely be affirmed that these people carried with them the language born of the intercourse of the different races from outside with the natives of the soil. A language flourishes with the people to whom it belongs and at a place wherever they live. Even if Urdu poetry took its rise in Deccan, it was among the people of Delhi who were forced to settle in Deccan; the credit can never belong to the Deccanis. From the verses written in the earliest epochs we are able to trace both Soursemi, i. e., Punjabi and Deccani words and expressions. Let it be remembered here that Soursemi never became *lingua-franca* Deccanis. Its home as already stated was the Punjab proper, Delhi, Agra and the neighbouring tracts. By way of illustration I would refer to a sentence spoken by Syed Burhan-ud-Din Abdulla-bin-Mohammad, popularly called Qutab-i-Alam, who was the grandson of Makhdum Jahanian Jahangasht, and emigrated from Delhi to Gujrat before Baber came to India. That important sentence is fortunately preserved and runs as follows :—

”بیہ تَسَا نصیب دوہوں دیچہ“

“Son your fate lies in both,” i. e., “you shall have both of them.” Now the attribute Dakhni is quite forced upon Wali. In his works we do not come across a remote reference to Deccan. He has, on the other hand, bewailed the separation from Gujrat. Nor does his language help us in surmising that he belonged to Deccan. Like the sentence above quoted Waloi’s poetry retains the traces of Soursemi Apabhransa-Prakrit as we find intact in present-day Punjabi. Those who have read Wali’s “Rauzat-ush-Shuhada” carefully, will bear me out. In the “Rauza” we find such Soursein words which are still in vogue in the Punjab; as, for instance, “Disna” to see; “Sitna” to throw

down : " Anjhwān " for tears and so on. I give here a few lines from the same —

دئے بعد از اُسے گودی میں ٹھارا
دسے جیوں چاند کے پہلو میں تارا

لے اپنے ساتھ عبد اللہ عباس
چلے دانتھیں نکل کر معویہ پاس

او نیزہ سٹک کے سرکیا میان سوں تیغ
گر جتا اور برستا جوں چلا تیغ

The fragments of speech or verse of the poets prior to Wali, that have come down to us show the same traces. Here I cannot go into any details which require full and separate treatment. In short the following conclusion may be safely drawn that

- (i) In early Urdu Sourseni was the chief element, and that
- (ii) Urdu poetry took its rise not among the people of Deccan but the people of Upper India.

After this rapid survey of the origin of Urdu poetry let me note the different changes it underwent. The best and easiest way of marking the periods of change and new birth in literature is to find out the outstanding features of a particular period and the legacy which it left for the change to follow, as well as to point out the new forces and circumstances which brought into existence a new school.

Literary Divisions.—Literarily the Urdu Poetry can be divided into three schools : (1) The classically erotic schools, which for brevity's sake I shall call "Classical", with its varieties ranging from Ghazal proper to love-romances embraced in Masnawi and Wāsokht, and the intricacies and luxuriousness of style exhibited in Qasida and Matsiya ; (2) Natural Poetry. I use this term as it is generally understood in Urdu, while it has no resemblance to the naturalist school of poetry and drama as understood in the West ; and (3) Communal Poetry. I shall make some remarks on each of these three schools before I come to the most important period of the Renaissance.

Chronological Periods.—Urdu poets for convenience of reference can be divided into four groups :—

1. Mohammad Shahi,
2. Shahalami,
3. Bahadurshahi, and
4. Victorian.

Wali, Abrū, Mohammad Shakir Naji, Mazmun, Yakrang, Hatam and others may be assigned to Mohammad Shalu period. To Shahalami period belong Meer, Sauda, Dard, Mazhar, Insha, Soz, Jurat, Mir Hassan, etc. Naseer Momin, Zang, Nasik Atash, Naseem, Anees, Dabir, Ghalib, etc., can be assigned to Bahadur Shahi period. The Victorian age I calculate from 1858, the time from which India was transferred from the control of the East India Company and was directly taken over by the Crown. This period dawns, therefore, with the famous Royal Proclamation of Queen Victoria and starts with Sheft and Mirza Naseem and claims Ameer, Jalal, Zaheer, Majrūh, Dagh, Azad and Hali. Along with these I would rather have placed Ghalib who lived in old age in a part of the Victorian period, but he really belongs to the Bahadur Shahi epoch in which he flourished. His style crystallised and poetry attained maturity before the Sepoy Mutiny convulsed the country and bearing as he did the spirit of the Bahadur Shahi epoch, notwithstanding the distinctive marks which distinguished his poetry from that of his contemporaries, his place cannot exactly lie in the Victorian age.

After these observations on the chronological division I revert to literary divisions of Urdu Poetry mentioned above.

THE CLASSICAL SCHOOL.

The classical school having its start in Shahalami period and reaching its climax in the Victorian period in Dāgh and Ameer embraces a vast bulk of Urdu poetry and an unlimited number of poets. The Ghazal, though only one of the many forms of poetical composition prevailed in all the various avenues of the good old school, and indeed is the keynote of all classical poetry in the Urdu language. Whatever form or metre adopted the same strain of erotic sentimentalism and imaginary declamations were its characteristics. Realism and sincerity were, in the majority of cases, foreign to them. Like Elizabethan sonneteers when they assumed aims of sincerity they came to belong to the role of dramatic lyrist and as it were proclaimed "I did best, when I had least truth for my subject."

The age in which our classical poetry took its rise and flourished, was, like the Tudor period in respect of English, "intoxicated with language. It went mad of a mere delight in words." Comparatively speaking, during the Mohammad Shahi period Hindi was the prominent feature of Rekhta, which in

Shahalami period began to give place to Persian and Arabic legendary and folklore. In respect of subject matter and form Urdu poetry was enriched with constant and free borrowing from Persian and as the English historian says of his own language "like all artists who become possessed of a new medium, they used it to excess." So far as ideas and subject matter are concerned they drew upon Hindi very rarely. Let it be remarked that here as elsewhere in referring to our poets, I never mean to draw, nor there does exist, a communal line, or a line of distinction between the Hindu and Muslim poets of Urdu. In fact as far as diction, phraseology, turns of expression and subject matter of poetical composition are concerned, there existed no dividing line between Hindu poets and Muslim poets of Urdu. Their chief matrix was one designed in Shiraz, Isfahan or Neshapore. Almost every poet of note of the Shahalami and Bahadurshahi periods was a courtier of the Moghal Court or that of a nobleman, and most of the Victorian poets somehow managed to secure the patronage of Ruling Princes of Feudatory India or lesser chiefs. The position of our poetry in its early epochs was something like that of English poetry in pre-Spenserian time: the superstructure of the former was based upon materials of Persian origin, while that of the latter was based upon that of Italian invention. Meer and Sauda, the greatest masters of poetic art started indenting on the local markets. The creed of our poets has been, as Shelley puts it, "the pleasure that is in sorrow is sweeter than the pleasure of pleasure itself." In compliance with the well-known saying they always went to the house of mourning in preference to the house of mirth. Although the verdict of the times has gone against it our poetry of Shahalami period can hold its own before the jury of fair criticism. No doubt the tragic and morose and despondent strain is the reigning factor of the best type of the poetry of that period, it was, all the same, genuine. A poet is the spokesman of the sentiments of the nation. In that period the nation was in mourning over the disruption of the great empire and constant internecine and other wars were devastating the country. The great edifice built up by Akbar and Man Singh, Khan Khanan and Todar Mal was crumbling. Such times cannot produce the poetry of hilarity and exhalbaration. Hence we have Meer Taqi and Khwaja Meer Dard as the best exponents of these times.

There is one glowing aspect throughout its whole range which I regret to note has unfortunately escaped notice of our chroniclers and writers. That glowing and glorious aspect of the classical school comprises in its teaching tolerance, bringing about a judicious mixture of the Hindu and Muslim culture which both though very highly refined and advanced at the time had nevertheless certain angularities of religious and social character which were in no time rubbed off by the influence of the poet artist. It was not Akbar's Din-i-Ilahi nor Aurangzeb's Fatawa which placed the Muslim side by side with the Hindus

but it was our classical poet. The glory of our classical school does not lie in the inimitable verses left by Meer or Sauda, Dard or Ghalib, Nasikh or Atosh, Naseem or Hassan, but the real glory and grandeur of our classical poets lies in removing all those social and cultured differences in as much as they stood in the way of our secular well-being and good fellowcitizenship. The cultural unity brought the social and religious amenities in its wake. In these days of communal strife of a grim, ghastly nature I may be taken for a Rip Van Winkle if I go on speaking on this fascinating feature of this school, and all that was the beneficial result of that "Hindulman" culture, the direct outcome of the classical school of our Urdu Poetry.

But fanatics and diehards are a bane of the most wholesome and blessed movements in the world. The Bahadurshahi and the early part of the Victorian period and in it the Lucknow section in particular took away the very spirit and vitality of the classical poetry. They by inventing that wordy drill which is poison to all good literature stereotyped our poetry under such strait jackets of convention, watertight artificialities and cast iron restrictions that sentiment had no pure air to breathe and gave way to sentimentalism. Thrilling tenderness and delicacy of sentiment and sober emotion of Meer and Dard, and vivacity and pungency of Insha and Sauda were supplemented by glaring absurdities which were in many places shocking to the moral sense. The manly hilarity and verve coupled with lofty flights of poetic imagination of the earlier classicists was substituted by bizarre commonplaces or futile hair-splitting. The ghazal as it was constituted by the ancients was from the very beginning desultory. The poet moves from one subject to another so waywardly, in one line he is holding an underground conveyance with the two Karma angels, in the second he is lifted to the seventh heaven of happiness enjoying the felicitous company of the beloved, in the third he is hanging down his head to his fairy love as if she were a public executioner, in another he and that imminent being are one and the same, in a line further on he is seen swearing at the cursed rival who is fortunate enough to obtain a smile from her. Such kind of random versification, no matter what degree of elegance of style and excellence of diction it might possess, cannot be called Poetry. It can find no place in the international durbar of Saraswati. Psychologically speaking, constant practice or study of such fantastic vapourings is ruinous to one's mental health. It impairs and in the end kills the capacity for sustained thought and consistent concepts, and dwarfs the mentality of the people who came in contact with it. In fact Ghazal, a jumble and hodge-podge, almost like madrigal, was originally designed for youngsters to begin with. It cannot be, and was not regarded by sensible poets as the alpha and omega of Persian or Urdu poetry. It was all the more spoilt when it approached the Bahadarshahi period. Cast-iron canon of style, i. e., the way of putting a hackneyed theme

became the only point of skill and craftsmanship that was to be looked at. Even in this particular respect the unit of the Delhi classical school was phrase while that of Lucknow school was word; each word fastidiously chosen and like Miltonic style "commonly with some air of an original and lost meaning about it." In this as in his structure Milton accomplished what the Renaissance had only dreamed; but Lucknow failed to a great extent owing to its leaning towards sentimentalism, while Delhi confined itself to sentiment and so did not lose ground. Lucknow, however, though it could not avoid those incursions of high sounding words, pertinaciously picked up from Arabic and Persian lexicons lent that sprightliness, smartness and vigour to the style of the Ghazal which influenced even the Delhi School. Much boast has been made of the mystic or Sufi literature interlarded in the output of our classical school. No doubt there are stray lines sprinkled here and there in a ghazal which are proverbial and are like occasional silver lines in the dark gloomy firmament. But the same does not lead us to the goal of spiritual satiety and peace of mind, as the next line drags the hearer to the mire of sensuality.

There are two outstanding figures in the later range of our classical epoch which deserve special mention. I mean Shah Nazeer Akbarabadi and Mirza Ghalib. Like all geniuses Nazeer came rather before time. The taste of society was vitiated. It was mad with the love of the grotesque. The magniloquent style, fusty and antiquated diction and on the whole a poetry based on fastidious artificiality was bound to run tilt against that true and genuine poetry of Nazeer and fail to admire the *naivete* and freshness of his inspired pieces, and subjective charms of his galloping verses. As Bhavabhuti was the dramatist of the people, so was Nazeer the poet of the people. He is the only poet of his time who employed his muse to depict nature; in a word he anticipated Azad.

Mirza Ghalib, on the other hand, was like Kalidasa the poet of the select few. Robert Browning furnishes an exact parallel. Both were bug-bears to their contemporaries. While Zauq and Atash were like Tennyson elaborating and decorating the obvious, Ghalib like Browning was delving into the esoteric and bringing up strange and unfamiliar forms'. Perhaps he had a prevision of the destiny of his poetry. Said he

کو کیم را در عدم اوج قبولی بوده است
شهرت شغرم به گیتی بعد من خواهد شدن

Out of the whole lot of our classical poets Ghalib was the least understood in his time, and is the most appreciated, most frequently quoted and the most commented upon poet in our times. Dagh and Ameer had a nice mode of expression but there

was nothing left untouched by their predecessors for them to say. It was all bizarre objectivity that they with their left hand dressed up in eloquent and elegant style. I quite agree with the American critic that "the thought or feeling a thousand times repeated becomes his at last who utters it best." But what would be said of those whose whole life was devoted to try to effect this appropriation of other people's property and to divorce constructive genius and originality from poetic imagination. I have refrained from quoting instances for want of time, but on this point I cannot help showing the way adopted to appropriate other people's intellectual products. I wonder what you would say of the six couplets which I quote from six masters of our classical school : improvement or plagiarism :—

Meer Taqi was the first to serenade

کچھ تو کہہ وصل کی بھر رات چلی جاتی ہے
دن گزر جائے ہیں اور بات چلی جاتی ہے

Insha came next in his Chaori vein

کچھ اشارہ جو کیا ہم نے ملاقات کے وقت
ٹال کر کہنے لگے دن ہے ابھی رات کے وقت

Then comes Dagh in his piccadilly fashion

کیں جو بولوں تو بات جاتی ہے
چپ رہوں گر تو رات جاتی ہے

Then comes Ameer appearing like a saint in the robes of the stage clown

میں نے جو کہا اُن سے کہ وہ بات نہ ہوگی
تو ہنس کے یہ کہنے لگے کیا رات نہ ہوگی

Then follows the wily and clever Jalal under the mask of a changed rhyme

عرض مطلب میں شان جاتی ہے
رات اے ہر بان جاتی ہے

Last but not the most punctilious comes Riaz who, according to his own confession, came in old age to Lucknow for rejuvenation.

جب یہ کہا کہ حشر میں وہ بات بھی تو ہو
ہنس کر کہا کہ دن ہے کہیں رات بھی تو ہو

I for one fail to see an improvement on or a better uttering of what was said by the immortal Meer Taqi.

Lord Houghton tells us that the merit of originality was denied to Keats. Chaucer is dubbed a free borrower. All of us admit that Spenser was inspired by Orlando of Ariosto. We also know that Goethe was influenced by Kalidasa and that Milton was inspired by Dante. We find that Coleridge improved upon Lessing's pretty poem 'Die Namen'. Of immortal Shakespeare it is the finding of all critics that in all his plays he is known to have invented only one single plot, though I am doubtful even about this one solitary exception. Burns is said to be always ready to use up the work of others or take a large hint from it. In 'Jason' William Morris's indebtedness to Chaucer is manifest. In a like manner Zauq was influenced by Nasik and Ghalib was inspired by Bedil and Mutanabbi in his early compositions and by Meer in his later poems, as Nasik was by Saib and Meer. Dagh was influenced by Jurat and Janhar and Ameer by Dagh in the latter days. Such instances can be multiplied from all literatures of the world and none of them set down as instances of the poverty of poetical conception or of plagiaristic execution. This aspect is entirely different from that shown by the instances of appropriation referred to in the lines already quoted. Be it as it may, that is quite different from the borrowings and plagiarisms of our latter day classical composers. Azad was perfectly right in accusing these worthies of

” اگلے ہوئے نوالے منہ میں پھرانے “

(to revolve disgorged morsels in one's mouth). Although Dagh and Zaheer in Delhi and Jalal and Ameer in Lucknow were stirring the dry bones of Urdu poetry and putting in all their talents to resist the onslaught of the new movement, it had really run to seed. To cut the long story short, our poetry, such as it was in the Victorian period, i. e., in the third quarter of nineteenth century, had lost all vestiges of life and had become like a lay figure. Such was the sad and wretched plight of the classical school when Azad came upon the scene.

THE NATURALIST SCHOOL.

The close of the Sepoy Revolt opened a new epoch in all Indian Vernacular literatures. Lord Macaulay was not an Oriental Scholar or else he would have left us in his historical minute a forecast of the effects of the new system of education that he was advocating, on the literature of India. The Renaissance of poetry and literature in England was different in its causes and environments from those that attended the Renaissance of Urdu literature. The Renaissance in England was the result of the revolt against mediævalism, while here in India it was the result of revolt against the decaying classicism. There

it was caused by the rediscovery of ancient literatures, here it was brought into existence by the discovery of a new literature. There it was the result of a universal impulse, here it was the result of impulse of one single individual.

Delhi was without Bahadurshah and Lucknow without Wajid Ali; Farrukhabad and Banda were gone. Rampur the only feeder left, could not keep the main stream from running dry, while it was a far cry from the classical centres to Hyderabad Deccan. There remained no vestige of the old royalty and aristocracy which could set fashion and convention to those things and institutions which were the very life and soul of our literary taste and culture. Side by side with these momentous changes in the social and political environments of society there were for about half a century silently at work arts and sciences of the West, which brought in their wake as Macaulay had foreseen the ideas of democracy which are an offshoot of all constitutionalism. The new system of public instruction devised on Western lines was opening up new vistas, in fact a new horizon full of hitherto unknown intellectual and political wonders before them, which required a new angle of vision. The new education was setting adrift from their moorings the settled conviction of the people regarding society, art and culture. Thus were we constituted when Swami Dayanand Saraswati and Sir Syed Ahmed Khan came out with their programme of reforms. These great reformers did not aim at inaugurating a new religion or society but to purify the mind of their respective co-religionists of all mal-practices, evil customs and superstitions that had retarded all their material and spiritual advancement, and to bring them back to the altar of the Vedas and the Quran. Once it was brought home to the people that all their social abuses and religious heresies were due to their getting off the gear of true religious principles they were easily won over towards reforming their ways. It is a sociological truth that once you free a people of the fetters laid on the vitalest part, other parts will themselves be let loose as a matter of course in rapid succession. The slave mentality created and fostered by the Pir and Parohit received a rude shock and people were unceremoniously awakened to see that a new world was blossoming before their dreamy eyes. People now were able to see things in their right perspective.

How was poor, decrepit classical poetry to survive all these potent and irresistible forces which were steadily and systematically agitating public mind, and resist the great upheaval that was already signalised. It was destined for the late lamented Shamsul Ulma Molvi Mohammad Hussain Azad to read the signs of the times. The greatest difficulty for Azad was to counteract a general apathy and contemptuous indifference towards Urdu poetry. Perhaps people thought that it was good for it to die natural death. Either they were hypnotised by the superior spirit and magic spell of western sciences

and arts which they had newly come across or they were quite disgusted with the poetry of the time and thought it was simply waste of time and energy to bestow even a passing glance on it. Azad was able to read the heart of his countrymen and started with a stout heart to overcome the immeasurable difficulties he came face to face with. He appealed to them not to be misguided by the wrong view of Macaulay that poetry flourished only in dark ages. The first item on his programme, therefore, was to persuade and exhort the public to shake off that apathetic attitude. To gain this object he delivered a series of lectures. If I am not wrong his first lecture was delivered in Lahore in August 1862, some two years before Ghalib's death. This lecture of his is of great historical importance and a rather long quotation from it may be excused. I give here translation of certain passages of the same ; the original may be found in his works :—

“ The very principles of philosophy and science by which the right-minded people infer the proof of the Almighty and establish His oneness, are perverted to heresy and atheism. Therefore philosophy and science cannot be denounced if they are perverted. Similarly by the foul language and pernicious thoughts of poets, poetry cannot be defamed as heterodoxy. Indeed such poetry is not real poetry because real poetry is experience of emotions and sentiments engendered by serious thought and has a special communion with what is called divine. Pure thoughts in course of elevation attain the dignity of Poetry.”

With this earnest hope Azad closes this memorable speech :—

“ It is to be hoped that defects in poetry will not be omitted when the merits and demerits of other matters will be encouraged or reformed and some day, though not immediately, good fruits will result. According to Azad's lines—“ Your bewailings may not attract attention now, some day they will be noticed.” There is another lecture of Azad's fortunately preserved which was delivered in May 1874. He said :—

“ My countrymen, you are composed of two classes, one Hindus and the other Mussalmans. You know who are Hindus. Hindus are those whose language contains in essence what to-day you desire for yourselves. If it is Bhasha, it can claim superiority over all others because it possesses a capacity to describe realities. The pre-eminence of Sanskrit is beyond all description, because in addition to poetical themes it has moulded in verse, from History and Geography to Medicine, Logic and Jurisprudence, indeed all that it laid its hand on.

The other section is Mussalmans whose home of origin is Arabia, where not only men's language but that of ladies and slave girls, when they talked in high emotion attained the dignity of poetry. Is it not a matter of regret that descendants of such

ancestors be deprived of the heritage? Is it not a matter of despondency that our language to-day is devoid of effectuality? Is it not painful to observe that our language in the eyes of others be subjected to taunt owing to its poverty of diction? O soil of India: if thou canst not produce Amrulqais and Labeed, produce a Kalidas, Ye, India's forests and wilds, if ye cannot produce a Firdausi and a Sadi. produce a Valmikié!"

In summing up his speech Azad said:—

"It is too well-known that for poetry firstly genius and the academic attainments are necessary, after this perfect interest and perpetual practice is required. In the arena of prose I am not an equestrian but only a pedestrian and am prostrate in poetry; but look at my simplicity or foolhardiness that I am ready to run in every arena. This because I might bring out something useful for my country. I have recently composed some Masnavis on different subjects which I am ashamed to call poetry. I present however to you this moment a Masnavi on the description of Night."

It was after this lecture that Azad recited one of his specimens of the new type of poetry; it is entitled *Shah-i-Qadr*. Its historical value cannot be exaggerated. Next month came about the first poetical symposium or *Mushaira*. This memorable *Mushaira* took place on the 30th June 1874 in the premises of the *Anjuman-i-Punjab* before a large distinguished gathering. Seven poets in addition to its founder—Azad, took part in the *Mushaira*. I have given a full account of this historical *Mushaira* in the *Inqilab*, a Lahore monthly. After this epoch-making symposium of Azad there used to be held a number of monthly meetings in one of which *Shamsul Ulma*, *Khawaja Altaf Hussain Hali* recited his first poem of the new type. One word and I am done with the inauguration of the new school of Urdu poetry.

In the presence of these incontrovertible facts, I wonder what will be said of the audacity of men whose conscious or unconscious perversion of facts and consequent erroneous judgment is insensible. In this connection I am bound to notice the two recent Azamgarh publications, *Gul-i-Rana* and *Sherul Hind*. One fails to conceive how *Hakim Abdul Hayi* and *Maulana Abdussalam Nadmi* who were nourished with the milk of celebrated *Shibli's* erudition and research, could have borrowed the ways of the German criticasters like *Weber* and *Windisch* in tracing the origin of things. One is sure to be disappointed with the burlesque narrative given in the said works. Both the learned authors, for reasons best known to themselves, have not hesitated in garbling facts and have one in a rather roundabout way and the other directly, tried to show that it was not Azad but *Hali* or somebody else who laid the foundation of the new Poetry and new style *Mushaira* of the *Anjuman-i-Punjab*. Let us see what has *Hali* himself to say on this. In the introduction

to the collection of his poems entitled "Majmua-i-Nazm-i-Hali" writes Hali :—

Rendered in English it will run :—

"In 1874 when the writer of these lines was attached to the Government Book Depot and lived at Lahore, Anjuman-i-Punjab organised a symposium of poets at the suggestion of Maulvi Muhammad Hussain Azad and with the support of Col. Holroyd, Director of Public Instruction. This symposium used to meet once a month in the premises of the Anjuman. Its object was to enlarge the scope of Oriental poetry and base it on reality and verities which had hitherto been circumscribed and monopolized by amorousness and exaggeration."

It would be interesting to observe how the lead given by Azad was received by those who were engaged in the important work of social and educational reform. It encouraged Hali to openly express his views regarding the latter day classical poetry. It did not escape Sir Syed's notice. In his essay on "Flattery" he had one incidental reference to the extravagance and exaggeration indulged in by the poets of the time. Maulana Deputy Nazur Ahmad in "Taubat-un-Nusih" did not forget the Ghazal while making his hero Kaleem the embodiment of the social vices prevailing at the time. Such declamations and tirades, incidental as they were, helped the cause taken up by Azad. It was in the early stages that Hali, Arshad and Adib came out to support the banner raised by Azad. The founder of the Natural School was a Persian and Arabic Scholar. He was a profound master of Persian. Azad had the advantage of sitting at the feet of that great master and craftsman Shaikh Ibrahim Zauq. Azad was born and brought up in Delhi and was managing his father's printing press when Garson De Tassi was writing his famous encyclopaedia of Urdu poets. Hali was master of the two oriental languages and had the benefit of the company of Nawab Mustafa Khan Shefta and the discipleship of Mirza Ghalib, Malvi Saiful Haq Adeeb, a promising disciple of the same master and Mirza Abdul Ghani that of Mirza Sabir who were of the best equipped and gifted poets of the classical school and professionally attached to the Punjab. Both of them likewise worldly men had their finger in two pies. They did not renounce the classical school like Azad and Hali. Maulvi Ismail of Meerut, one of the late converts, was mainly devoted to translating suitable portions from school readers and text-books in the new natural style. Azad and Hali in particular and others generally were overscrupulous in avoiding the extravagances and embellishments of the classical school in a puritanic manner. The inevitable consequence was that though Azad and Hali wrote some very pungent and strong poems and their writings had point and effect, their puritanic way did not go down. Azad did create a school of his own and gathered round him a band of devout followers, but all his achievements were of a negative character!

They, it must be said to no discredit to Azad and his followers, made a correct diagnosis of the malady prescribed the very requisite medicine, but were unable to make it palatable. The few who were touched by the reform gave up the old way but did nothing effective in the new one. Dagh, Anwar and Zahir in Delhi and Jalal and Ameer in Lucknow were flourishing and the number of their admirers was daily increasing. No doubt certain pieces of Azad and Hali are inspired. Hali's *Munajat-i-Bewa* (Laments of a Widow) and Azad's "Nau Tarz-i-Murassa", have passed into classics. Azad having Shia inclinations was able to lend any amount of fervour and pathos to his poems. Hali being a Ghair Muqallid was more syllogistic and matter of fact in his poems. He looked to the subject matter and neglected embellishments of style.

Renaissance has not produced anywhere great masters, but it has purified taste, reformed tendencies and sobered the mind. It produced no Erasmus or Scaliger at Oxford and Cambridge. Similarly it did not produce a Meer or Sauda in the Natural school. Azad's innovation had a more vital effect on the future of Urdu literature than the present. He had only one object in view, not to let Urdu poetry die. The process of resuscitation once started took its due course and left the rest to nature. He and his followers were very cautious to feel their way before they made any long strides. Neology or minting and introducing new words was excluded from their programme. They contented themselves with the old phraseology and idiom and figures of speech. Hyperbole and extravagance and artificial manipulation was not known to them. They did not make their compositions like the mosaic of their classical predecessors. Some of them, it must be admitted, blundered on the opposite side. Their puritan simplicity sometimes was reduced to prosaicism which to a great extent adumbrated Hali's communal poetry that followed as a sub-section of the natural poetry. They were not fantastic in their details nor infructuous in effect. Their main purpose was to convince the country that there was scope and capacity in their language to employ its poetry for other purposes than for lascivious criticism, artificial subtleties and petty lyricism. This was the signal call and slogan of Azad, which was heartily responded to by the people who were sick of the morbid classics and were thirsting for something sober and dynamic by their newly acquired taste and culture. In a word the poetry of the new school was in the stage of adolescence when Azad was called upon to see the other wing of Urdu literature, i. e., prose and Hali was monopolised by the Aligarh movement. The followers being not masters of the art went on publishing feeble and faulty productions, and the witless took the place of the briskness and freshness of diction, purity of sentiment and picturesqueness of the imagery which gave the writings of the master that consummate loveliness which exercised such compelling influence in behalf of the new school that

intelligentsia gave no weight to the polemic literature which was pouring in from the refractory classical camp. The Oudh Punch of Lucknow carried on a long series of hyper-criticism on the poems of Hali for more than a year and spared no cheap witticism in crushing the spirit of the new school. But it is a wonderful phenomenon to observe that the very man who was leading the opposition was at last won over by the advancing forces of the persevering crusaders and became afterwards a tower of strength to the cause they were fighting for. The late lamented Munshi Ahmad Ali, Shauq Qidwai of Lucknow, was the last of the barons of the aristocracy of letters which was evaporating like dewdrops before the rising sun. He was one of the shining lights of the classical school and a consuming master of the craft. His conversion to the new dispensation together with that of Babu Jawala Prasad Burq, Suroor Jahanahadi, Chakhast Lucknavi, Nadir Kakorvi, all belonging to Lucknow school and of Burq, Shaida, Nayil, Agha Shair and others from Delhi and the rise of Iqbal, Mir Nairang Nazir and Mahrum in the Punjab was the last straw on the camel's back. The classical camp after these desertions collapsed, and the Kurushitra came to remain only a matter of past history.

COMMUNAL POETRY.

If we substitute Communal for Religious, what is said of the state of English in the Renaissance period, that it took the course of utilising poetry for religious purposes as its period was not apart from the period of Reformation, exactly applies to Natural poetry in India. Somehow that great socio-religious reformer Sir Syed Ahmad Khan was struck with the idea that the new natural poetry may be utilised for socio-religious or communal purposes. Khawaja Altaf Hussain Hali took up the suggestion and sat down to write his Musaddas which was the corner stone of his literary fame. It cannot be finally decided whether men create movements or movements men. We may accept Khan Bahadur Shaikh Abdul Qadir's view of Hali's poetry. He thinks that most of the writings of Hali "would have been nowhere had there been no Syed Ahmad." Hali by giving in lucid, running verse an illuminated, soul stirring account of the rise and fall of Mussalmans secured remarkable success for the cause that the pioneer of Aligarh reform was fighting for. I endorse every word of the enthusiastic praise bestowed by the learned Shaikh Sahib on Hali for his Musaddas Madd-o-Jazr-i-Islam which fills more than two pages of his brochure. Critics and men of very high culture and taste have recorded a note of disapproval of the language and style in which the poem is couched. I would like to explain away all these charges in a word that such slips and defects are found in the production of all masters of the poetic art and Hali is no exception. To me it appears that the rather unnecessarily strong language used by Hali against the then

modern Gazal and classical poets in general, both in his introduction and the body of the poem beginning with the line

”وہ شعر اور قصائد کا ناپاک دفتر“

and in the Introduction to his Diwan roused the ire of lovers of the old school who did their worst in running down Hali's poetry and his reputation. As to the other controversy that followed the publication of the Musaddas and was led by Molvi Mohammad Ismail Narnauli, it does not fall within my province to touch upon.

Almost all that Hali wrote after leaving Lahore was of communal nature, except Munajat-i-Bewa in which familiar Hindi was almost wholly drawn on.

Here I would refer to the observations made by the celebrated American critic and poet whose writings form part of standard English literature. I mean James Russel Lowell. These are his views regarding communal or national poetry. Says he :—

“Both Dryden and Daniel are fine poets, though both of them in their most elaborate works made shipwreck of their genius on the shoal of bad subjects.”

Again in reference with John Barbour's "Bruce" he says :—

“It is national in a high and generous way, but I confess I have little faith in that quality of literature which is commonly called nationality a kind of praise seldom given where there is any thing better to be said. Literature that loses its meaning, or the best part of it, when it gets beyond sight of the parish chapel is not what I understand by literature.”

There is much truth in these observations. One can see that a communal or national poet “lacks that serene impartiality of mind which results from breadth of culture ; nay, he seems narrow, insular, almost parochial and reminds us of those saints of Dante who gather brightness by revolving on their own axis”. But poetry, all the same, has been employed for practical ends, so did Hali and his followers.

Looking at the poem from the ethical point of view its conception was defective. It had an elegaic cast. It left the reader in gloomy despair instead of optimistic heartening. The supplement added to it afterwards does not quite fall in with the trend of the original poem like Milton's Paradise Regained and Arnold's Light of the World as sequels to Paradise Lost and Light of Asia. But all this we can say now, not when the Musaddas was all the rage.

There is a universally respected convention of the literary world that living authors are spared such discussion as I have undertaken. And I do not know how to introduce our great

Philosopher poet Dr. Sir Mohammad Iqbal in this survey of Urdu Poetry. I, however, believe, it will remain incomplete if I follow the convention to the letter.

Emotional and full-blooded like all our "Ahl-i-Khitta", Sir Mohammad Iqbal combines in him the other two qualities of mind as well—volition and intellect, to a very high degree. In his early days he belonged more to the natural school than communal. His lyrics and madrigals used to be the outcome of the most cheerful and debonair heart. The extraordinary freshness and verity of his subject matter, descriptive vividness of his imagery, conscious artistry of style and cleverly wrought metaphor are his chief merits. He never catered for the popular taste. Natural poetry would have been a metrical version of natural History had not Saroor, Chakbast and Iqbal enlivened it with their left hand. Iqbal's poetry is superb with fancy and exuberance of oriental mind coupled with penetrative sweetness and mobility of Western culture. It has always point and effect. He is very often inspired and never laborious and dull. Though his later compositions all belong to the communal school, you will not, however, detect in them that smack of narrow parochialism which is a characteristic fault of all communal and national poetry. His "Shikwa" for instance, has all the excellences which qualify a classic. Dr. Nicholson puts it correctly that "Iqbal has drunk deep of European literature, his philosophy owes much to Nietzsche and Bergson and his poetry often reminds us of Shelley." "Yet" adds he, "he thinks and feels as a Moslem and just for this reason his influence may be great." And indeed his influence is greater. But it is a great pity that of late he has taken Persian as the vehicle of his poetry and gone over his own words.

گیسوئے اردو کی منت پذیر شاعر ہے
شعیرانہ سوز کے دیوانہ ہے

THE ROMANTIC SCHOOL.

The renaissance has not yet reached its culmination. The dust from all corners of the ground was collected, made into clay, was given a form, yet its nostrils were still waiting for that breath of life, which may make it a living being. That breath of life came from the West which was conscientiously impatient to reap her old debts to the East. To clear the allegory, that breath of life was the realization of universal love and universal beauty for all and in each object of the world. The study and assimilation of the subjective poetry of Coleridge, Keats and Shelley poets of the English Romantic Revival has infused a spirit in the Urdu poetry and literature which surpasses in grace and excellence all the schools of days gone by ; and is bringing into existence a school which is the best and the most beautiful mixture of the learning

and culture of the East and the West. That philistinism and parochialism of the naturalist and communal schools is not now the staple food of no change die-hards, who are by no means *rara avis* in the domain of literary criticism. I am not in favour of those who would like to see all objective excluded and discarded from poetry. The artist has an aesthetic sense and knows how much of the different colours to mix up on his pallet. As matter and spirit must be co-existent, in the like manner subjectivity and objectivity must be wedded to each other to produce that subtle felicitous effect for which cultured consciousness always hankers.

With our poets of classical school as with Rossetti beauty was confined in human form. To the natural school as with William Morris it was apparently objective. To Romanticist it is both within him as well as without. Among the various characteristics of romanticism may be included as Hudson has described "its intense subjectivity and emotionalism, its love of nature and the picturesque". But at bottom it is as Victor Hugo put it "Liberalism in literature".

When you go to a big waterfall, unless you are under orders of your physician, you do not go there to inhale ozone but to see a great volume of water falling from a considerable height, bathing the rays of the sun in so many variegated hues and so on—a phenomenon you cannot have at home and therefore you enjoy it. But you shall not be able to enjoy it if you go to a waterfall and make a bowl of the palms of your hands, fill your stomach with water and heat a hasty retreat sneering at the Public Works authorities of the locality for not restricting the fall to a decently moderate volume to save those from drenching who go to it for drinking water. You have seen two sorts of men who go to a waterfall. This division extends itself to all mankind and thus divides the world into materialists and spiritualists. Really both materialism and spiritualism are interdependent.

Ghalib was very near the truth when he sang :—

اصلی مشہود و مشاہد و مشہود ایک ہے
حیراں ہوں پھر مشاہدہ ہے کس حساب میں

Like German philosophers he plunged into the abstract when he got bewildered to find out the entity and value of the phenomenon. Verily there is no distinction between substance and phenomenon, reality and appearance, as has been said—

Nor kernel nor husk in nature see

For there twain together be.

'One great truth in the universal life around us is that there is always going on an exquisite harmonising process which fuses

power and beauty into a dynamic reality, where both disappear with their individual qualities. Power becomes transformed into beauty and beauty into power.' Thus the system of the creative dance endures talking strong and weak notes in perfect symphony and illuminating the imagination and action, introspection and observation. With this trend of thought once obtained, language and style cannot be neglected. The new thought must be clothed in new language.

Says Mr. Mair :—

"The new poets have to find their own language, to enrich with new borrowings from other tongues the stock of words suitable for poetry."

Hence the process of Neology, i. e., new ways of inflection and minting of words and compounds is the indispensable stage to reach in the course of evolution of Urdu Poetry.

Let me close with what the spirit said to Faust :—

"The realm of spirit is not closed,
Your eyes are dull, your heart is dead.
Up scholar, up, and undismayed.
Bathe your breast in the morning red."

B. M. DATTATREYA, Kaifi.

AN HISTORICAL SURVEY OF ASTRONOMICAL AND MATHEMATICAL RESEARCH IN ANCIENT INDIA.

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I propose to give in this paper a short account of the contributions made by the ancient Hindus in the department of Astronomy and some branches of mathematics. I shall begin with Astronomy and then deal in turn with Geometry, Algebra and Arithmetic.

Astronomy.

Among the Hindus, two different classes of knowledge were included under the term *Jyotish*.

- (i) *Ganita Jyotish* (नणित ज्योतिष) or Astronomy.
and (ii) *Phalata Jyotish* (फलितज्योतिष) or Astrology.

The motions of the sun, moon and the planets, the determination of their places among the stars, the calculation of the eclipses, the prediction of their occurrences, divisions and sub-divisions of time form the subject matter of Astronomy and the treatises dealing with these are called *Siddhantas* (सिद्धान्त). The influence which the planets and the other heavenly bodies are supposed to exert on the inhabitants of this earth on account of their position among the stars and their conjunctions with other planets and stars is dealt with in *Phalita Jyotish* or Astrology. The *Phalita Jyotish* is again sub-divided into two parts—*Sanhita* and *Hora* (संहिता and होरा). If the influences of these heavenly bodies operate on a country, race or nationality or if they embrace a particular period of time; it is *sannita* and if on the individuals affecting the concerns of their earthly life, it is *Hora*. Of this three-fold division of *Hindu Jyotish*, I shall concern myself with a brief history of the growth, development and decline of the formal Astronomy known as the *Siddhantas*. This history may be divided into four periods :—

(1) The Vedic Jyotish period (approximately, from 4500 B. C. to 1200 B. C.).

(2) The *Sanhita Jyotish* period (about 1200 B. C. to A. D. 78, that is, to the commencement of the *Saka* era of *Shalivahaka*).

(3) The *Siddhant Jyotish* period (from 78 A.D. to about 1150 A. D.)

(4) The *Karana Jyotish* period (करण from 1150 A. D. to modern times).

1ST PERIOD.—The earliest trace of Astronomical knowledge among the Hindus was to be found in the sacred writings of the Vedas. In fact, Astronomy was studied as one of the six limbs of every one of the four Vedas.

शिक्षा कल्पो व्याकरणं निरुक्तं ज्योतिषं गतिः ।

छन्दसा लक्षणं चैव षडङ्गो वेद उच्यते ॥१॥

The six limbs enumerated in the above verse are (i) शिक्षा—modern phonetics, (ii) कल्पः—rules about the rituals, (iii) व्याकरणम् grammar, (iv) निरुक्तम् a sort of dictionary of the difficult Vedic words, (v) ज्योतिषम् Astronomy, (vi) छन्दः Rhetoric.

This early period may be termed the Vedic Period the astronomical features of which are as follows :—

(a) A year of 360 civil days.

(b) A knowledge of the planets (and also their names according to Tilak).

(c) The division of the ecliptic into 27 Nakshatras.

(d) The division of the year into ऋतुः and ऋतुः

Towards the end of the Vedic period there was further development of the astronomical knowledge of the Hindus. The astronomy of this time being the astronomy contained in the Jyotish-Vedanga (about 1200 B. C. according to Dikshit)—a book supposed to be written by *Lagdha* (लग्धा) containing only 49 verses. There is a great divergence of opinion regarding the meanings of some of the verses and the interpretation put on them. The special features of this time are, in addition to what has been said above, as follows :—

A five-year cycle of 366 days containing

- (1) 60 solar months,
- (2) 62 lunar months,
- (3) 1,830 civil days,
- (4) 30 tithis,
- (5) 67 sidereal months.

There is no mention of the 12 signs of the Zodiac, but there is mention of solar month.

There has been much controversy among the Vedic scholars about the Vedanga-Jyotish since Weber discovered it in the late sixties of the 19th century. Tilak, Jacobi and Dikshit placed it somewhere about 1400 B. C. and Bently and some other European scholars regarded it to be of much posterior date about 2000 B.C. The date of the composition of the Vedanga-Jyotish, the first formal astronomical book among the Hindus, is an important landmark in the history of the development of Indian Astronomy.

II. THE SECOND PERIOD extending from 1200 B. C. to 78 A. D.) is the period when Jyotish Sanhitas were composed. The authors of this period are Garga, Parasar and other Rishis and references to their works are made by later authors. This is the period of extensive rituals among the Hindus and strict rules were given about the time and the Nakshatras under which these rituals were to be practised and the inauspicious results that would follow in consequence of departure from these rules. In this period, no addition to astronomical knowledge over the previous period was observable but the Hindus probably began consolidating their astronomical knowledge. To this period belong the celebrated *sulva-sutras*, which contain the famous geometrical theorem that “the square on the hypotenuse of a right-angled triangle is equal to the sum of the squares on the sides.” The discovery of the *Sulva-sutras* by Dr. G. Thibant in 1875 effectively disposes of the erroneous view that the Hindus derived all their geometrical knowledge from the Greeks—a view which was fondly cherished by a certain section of European scholars. It may not be out of place to mention here that the study of Astronomy, Geometry and other branches of Mathematics among the Hindus arose out of the necessity of conforming to certain rules when

performing Vedic rituals and sacrifices. The sacrifices and rituals were to be performed when the moon, the sun, or the planets entered certain stars in the lunar-zodiac or the sacrificial fire was to be lit upon ground of certain geometrical shape or altars were to be constructed of certain volume and shape. These injunctions necessitated among the earlier Hindus a study of astronomy, geometry, solid geometry and other branches of mathematics. They were later on studied for their own sake.

III. THE THIRD PERIOD (A. D. 78 to 1150 A. D.) began with the Siddhantas of which 18 (or 20) have been enumerated. Development of astronomical knowledge reached its high watermark in this period which has been appropriately designated as its "golden age". A galaxy of famous astronomers flourished in this period and untrammelled by authority and tradition, they carried on their speculations and researches in hitherto unexplored domains of astronomy. The great Aryabhata (probably born at Pataliputra in A.D. 476), Brahmaputra, (born A. D. 589), the author of *Brahmasphuta Siddhanta*, Varabamibir (A. D. 505), the author of *Brihat Samhita* and the compiler of the *Panch-siddhantika*, and later on the celebrated Bhaskaracharya (A. D. 1114), the author of *Siddhanta Siromani* made important contributions in algebra, arithmetic, geometry and astronomy. *Surya-sidhant* of unknown authorship, Paulish Siddhant and Romak Siddhant, belong to this period. A short account of the more prominent among them will not be out of place.

1. *Aryab'ea* was the author of *Aryabhat-Tantra*, a complete treatise on the then known astronomy.

Aryabhat was an innovator. He was the first to make use of equations in solving problems; he was the first to make use of letters to signify numbers; he was the first to teach that the earth rotates round its axis and produces the phenomenon known as day and night. Colebrooke says, "Aryabhata affirmed the diurnal revolution of the earth on its axis. He possessed the true theory of the causes of the solar and the lunar eclipses and disregarded the imaginary dark planets of the mythologists and astrologers, affirming the moon and the primary planets to be essentially dark and only illuminated by the sun."

The *Saka* era of Salivahana (reckoned from 78 A. D.) had not come into vogue in his time as he never used that era. Neither did he use the *Sambat era* of Vikramaditya (reckoned from 56 B. C.) Dates are always given by him according to the *Kali era* (कलिका) which commenced from 3101 B. C. This means that if we subtract 3179 from the *Kali era*, we get the *Saka era* (सकवत्).

2. *Varaha-mihira* was born in the city of Kampilya in Magadh (modern Patna) of Brahmin parents. After learning the

rudiments of astronomy from his father Adityadas, he went to Abanti or Ujjain to study further. He compiled the *Panch-siddhantika* from the five older *siddhantas*, namely, (i) Partamaha or Brahma, (ii) Bashistha, (iii) Romaka Siddhanta, (iv) Paulish Siddhant, and (v) Sanra Siddhanta. He also wrote a book on astrology called the *Brihat-Sanhita*. He knew that the moon was a dark body and the lunar eclipse takes place on account of the moon entering the shadow of the earth. He says "one-half of the moon whose orbit lies between the sun and the earth is always bright by the sun's rays; the other half is dark by its own shadows, like the two sides of a pot standing in the sunshine."

Again he says "the true explanation of the phenomenon (of the eclipses) is this: in an eclipse of the moon, he enters into the earth's shadow; in a solar eclipse, the same thing happens to the sun. Hence, the commencement of a lunar eclipse does not take place from the west side, nor that of the solar eclipse from the east."—*Brihat Sanhita*, Chap. V.

3. *Brahmagupta*—born at Bhillamal near Multan in A. D. 598. He was a skilful observer and introduced important corrections to the places of the planets after making observations on them. He tried to disprove the theory of rotation of the earth and denounced Arybhata for enunciating a theory not sanctioned by tradition and Vedic authority. He was the author of (i) *Brahmasphuta Siddhant* and (ii) *Karan-Khandakhadyam* both of which were translated into Arabic as *Sind-hind* and *Alarkand* (as stated by Alberuni—Muslim author, born in Khiva in 973 A.D. and who came to India with Mahmud of Gazni when he invaded India. An account of contemporary India may be obtained from his Arabic book which has been translated into English by Dr. Sachan as "Alberuni's India."

4. *Bhaekaracharya*—born in 1114 A. D. at Bijapur. At the age of 36, he wrote the *Siddhant-Shiromani* which along with *Surya Sidhant* still remains the two standard books on Hindu astronomy. His "Lilavati" is a well-known work on arithmetic. He also wrote a book on algebra called "Bij-ganit."

Bhaskara considered the earth to be a round globe suspended in space by its own force.

नाम्याधारः स्वराक्यव वियति नियतं तिष्ठति इह

अस्य पृष्ठे । निष्ठं विश्वं च शएवत्

सदनुजादित्य दैत्यम् समन्तात् ॥

"This earth does not rest on anything else but is suspended in space by its own force; on its surface live all the men, devas, daityas and dānavas."

He also recognised the attractive force of the earth by means of which the bodies fall downwards, as the following verse in the "Siddhant Shiromani" shows :—

आकृष्टि शक्तिश्च मही तया यत् ।

स्वस्थं गुरु स्वाभिमुखं सशक्तयो ॥

आकृष्यते तत् पततीव भाति ।

सवे समन्तात् क पतत्वयं स्वेः ॥

"Heavy bodies are drawn towards the earth by its attractive force ; we think that the bodies are falling down but they are really being drawn towards the earth by its attraction."

From this we should not jump up to the conclusion (as some have done) that Newton (A. D. 1642—1727) was anticipated by Bhaskara in the discovery of the law of gravitation. There is a vast difference between heavy bodies falling downwards by the earth's attractive force and the law of gravitation which embraces the whole solar and stellar system. Newton showed that all bodies, great and small—the planet revolving round the sun and the apple falling from the tree—follow the same laws. Newton's most significant contribution to mankind was an idea—the idea that the world we live in, is not independent of the rest of the universe, but that every smallest particle of matter is connected with the most remote planet and star ; that we cannot think of ourselves as the centre of all things but that we merely occupy our place in a system of universal law."

The astronomical features of this period are :—

1. The mean motions of the planets.
2. The true places of the planets.
3. The gnomon.
4. The eclipses.
5. Planetary conjunctions.
6. Asterisms.
7. Heliacal rising and setting.
8. Instruments.
9. Time, cosmogony.
10. Astrology.

IV. THE FOURTH AND LAST PERIOD is the period of Karan-Jyotish. This is the period of decline of Hindu astronomy. The Siddhanta or formal astronomy consists of two parts :

- (1) The first part consists of rules of calculation without explanation and is termed *Karana* "करान" and,
- (2) The second part consisting of the explanations and the

reason for the rules is known as *Upapathe* उपपत्ति)

In this period the astronomers blindly followed the rules and failed to apply the Bija or the corrections (depending upon accurate observation) necessary for determining the positions of the planets with exactitude. Quite a large army of authors wrote commentaries on the older Siddhantas. Nothing original was ever discovered or new knowledge from other sources assimilated. To name only a few, we have :—

- | | | |
|------------------------|--------------------|--------------------------|
| (i) Yuan Raj | (ii) Ganesh. | (iii) Divakar. |
| (iv) Kuchana Charog. | (v) Mahadev. | (vi) Mahendra Suri. |
| (vii) Gangadhar | (viii) Lakshmidas | (ix) Ballal. |
| (x) Nilkantha. | (xi) Makarand. | (xii) Damodar. |
| (xiii) Dinakar. | (xiv) Nagesh | (xv) Krishna. |
| (xvi) Ananta Daibagna. | (xvii). Chintamani | Dikshit and many others. |

The Ganak Tarangini of late Mahamahopadhaya Sudhakar Dwivedi gives the biographical sketches of a large number of astronomers together with their works.

No account of Hindu astronomy is complete without a reference to the admirable work done in the cause of advancement of astronomical knowledge by Raja Yaising of Jaipur. He succeeded to the throne of Jaipur in 1699. "He showed a predilection for astronomical work and by constant study, he obtained a thorough knowledge of its principles and rules. He found the astronomical tables in use defective, and set himself the task of preferring new ones. With this purpose in view, Jaisingh took every means to ensure success. He attached himself to no particular school but studied Hindu, Muslim and European methods impartially. He collected astronomical books and had certain of them translated ; he organized a regular staff of workers and sent some of them to foreign countries to collect information ; he invited certain Europeans and others interested in astronomy to Jaipur ; he built a large observatory at Delhi and made careful observations there for seven years with a view to the preparation of a new star catalogue ; and afterwards he built other observatories at Jaipur, Ujjain, Benares and Mathura" In all his astronomical activities, he was very materially assisted by the learned Pandit Jagan Nath whom he brought to his court from the Deccan.

The following note by Prof. C.A. Vallino of Rome shows the influence of Brahmagupta and other Indians on Muhammadan writers: "The Muhammadans are the first scientific elements of astronomy to India. In A. D. 771 there came to Baghdad an Indian embassy, one learned member of which introduced to the Arabs the *Brāhmasphutasiddhānta* composed in Sanskrit in A. D. 628 by Brahmagupta. From this work (which the Arabs called *as-Sind-Hind*)

Ibrahim ibn Habib-al-Fazārī drew the element and methods of calculation for his astronomical tables adapted to the Muhammadan lunar year. Almost contemporaneously Ya'qūb ibn Tāriq composed his *Tarkīb-al-aflāk*, 'the composition of the celestial spheres', which was based on the elements and methods of the *Brāhma-sphutasiddhanta* and on other data furnished by another Indian scientist (K. U. K. H.) who came to Baghdad with a second embassy in 161 A. H. (A. D. 777-778). It seems that almost at the same time there was translated into Arabic under the name *al-Arkand* the *Khandakhādya*, written about A. D. 665 by the same Brahmagupta, but containing elements different from those of his other work. Abū'l-hasan al-Ahwāzī a contemporary of al-Fazārī and of Ya'qub ibn Tāriq, probably drawing on oral teachings of learned Indians, introduced to the Arabs the planetary motions according to al-Arjabhad (a corruption of Aryabhata, the name of an Indian astronomer who wrote in A. D. 500). These Indian works had many imitators in the Muhammadan world up to end of the first half of the Vth century of the Hijra (11th century A. D.); some astronomers (e. g., Habash-an-Nairīzī, Ibn as-Sambh) wrote contemporaneously books based on Indian methods and elements and books with Græco-Arabic elements, others (e. g., Muhammad ibn Ishāq as Sarabsī, Abu'l wafā, al-Biruni, al-Hazīn) adapted elements calculated by the Muhammadan astronomers to great artificial cycles of years constructed in imitation of those of the Indians.

GEOMETRY.

The earliest geometry of the Hindus is to be found in the *Sulva-sutras* of Bandhyana and Apastasumba which form parts of the Vedic literature. Geometry was studied not for its own sake but to enable the priests to construct altars and other figures of defined shape and size needed for the proper performances of their religious rites. The following are some of the problems solved by the Mathematicians of the Vedic cycle :—

1. The so-called Pythagorean theorem, namely "the square on the hypotenuse of a right-angled triangle is equal to the sum of the squares on the other two sides."
2. Construction of squares equal to the sum or difference of two squares.
3. Conversion of oblongs into squares and *vice versa*.
4. Construction of lengths equal to quadratic surds: the approximate value of $\sqrt{2}$.
5. Construction of successive larger squares from smaller ones by addition.
6. Determination of the area of an isosceles trapezium when the lengths of its parallel sides and the distance between them are known.

Later on, we find Aryabhata (A. D. 476) solving the following geometrical problems :—

1. The area of a triangle.
2. The area of a circle.
3. The area of a trapezium.
4. The distance of the point of intersection of the diagonals of a trapezium from either of the parallel sides.
5. The length of the radius of a circle. Aryabhata gave also the value of π $\left(= \frac{62832}{20000} \right)$ and the area of the circle as πr^2

Fresh contributions to geometry were made by Brahmagupta (A. D. 598 to A. D. 660) who solved the following problems :—

1. The construction of right-angled triangles with rational sides.
2. The various properties of right-angled triangles.
3. The area of a cyclic quadrilateral.
4. The properties of isosceles trapezium.
5. The properties of cyclic quadrilateral.
6. The properties of circles ; Brahmagupta gave the rules (i) for finding the diameter of a circle when the height and chord of a segment of it are given and (ii) for finding area of a segment of a circle. The first rule in the form given by the Hindu was not known in Greece. Musa (830 A. D.) learnt both these rules from Brahmagupta's works.
7. The volume of a cone as one-third the volume of a cylinder, on the same base and with same height.
8. The volume of a pyramid as one-third the volume of the prism.

Bhaskara summarised and methodized the result of all previous investigators, *e. g.*, Lata, Aryabhata, Lalla (499 A. D.), Varahamihir (A. D. 505), Brahmagupta, Sridhara (A. D. 853), Mahavira (A. D. 850), Aryabhata the younger (A. D. 970) and Utpalal (A. D. 970).

ALGEBRA.

“ Algebra is a Hindu science in spite of the Arabic name. Cajori suspects that Diophantus (A. D. 360), the first Greek algebraist, got the first glimpses of algebraic knowledge from India. According to Heath, the Europeans were anticipated by the Hindus in the symbolic form of algebra. According to De Morgan, the work of Diophantus is hardly algebraic in the sense in which that term can be applied to the science of India. According to Hankel, the Hindus are the real inventors of algebra, if we

define algebra as the application of arithmetical operation to both rational and irrational numbers or magnitudes.

The mathematician who systematized the earlier algebraic knowledge of the Hindus and thus became the founder of a new science is Aryabhata (born A. D. 476 at Pataliputra on the Ganges in Eastern India). He was thus over a century later than Diophantus ; but Smith proves that neither in methods nor in achievements could the Greek be the inspirer of the Hindu."

The points in which the Hindu algebra appears particularly distinguished from the Greek are thus enumerated by Colebrooke :

1. A better and more comprehensive algorithm.
2. The management of equations involving more than one unknown term. (This adds to the two classes noticed by the Saracens, viz., simple and compound.)
3. The resolution of equations of a higher order, in which, if they achieved little, they had at least the merit of the attempt and anticipated a modern discovery in the solution of biquadratics.
4. General methods for the solution of indeterminate problems of first and second degrees, in which they went far beyond Diophantus, and anticipated the discoveries of modern algebraists.
5. Application of algebra to astronomical investigation and geometrical demonstration in which also they hit upon some methods which have been reinvented in later times.

It was thus not a " primitive " algebra that the Hindus developed. The achievements of Indian algebra from the Vth to XIIth century have in some cases anticipated the discoveries of the XVIIth and XVIIIth centuries in Europe. Modern algebraists have thus only re-discovered already known truths.

The Hindu algebra of this period was the principal feeder of Saracen algebra through Yakub and Musa, and indirectly influenced to a certain extent mediæval European mathematics.

The Hindu discoveries in algebra may be thus summarised from the recent investigations of Prof. N. B. Mitra :—

1. The idea of an absolutely negative quantity.
2. The first exposition of the complete solution of the quadratic equation. (Brahmagupta A. D. 598—660).
3. Rules for finding permutations and combinations (Bhaskara, born 1114). These were unknown to the Greeks.
4. Indeterminate equations : " The glory of having invented general methods in this most subtle branch of mathematics belongs to the Indians."
5. Indeterminate equations of the second degree.

ARITHMETIC.

Dè Morgan says, "Hindu Arithmetic is greatly superior to any which the Greeks had. Indian Arithmetic is that which we now use." Professor Weber is of opinion that the Arabs borrowed from the Hindus their arithmetic and algebra in both of which it appears that the Hindus attained, quite independently, a high degree of proficiency. Professor Wallace says, "The *Lilavati* treats of arithmetic and contains not only the common rules of that science, but the applications of these to various questions of interest, barter, mixtures, combinations, permutations, sums of progression, indeterminate problems, and mensuration of surface and solids. The rules are found to be exact and nearly as simple as in the present state of analytical investigation. The numerical results are readily deduced and if they be compared with the earliest specimens of Greek calculation, the advantages of the decimal notations are placed in a striking light." In his "Hindu achievements in exact science" Professor Sarkar says :—

The two foundations of arithmetic were discovered by the Hindus :—

- (i) The symbols of numbers or numerals as they are called.
- (ii) The decimal system of notation.

Numerals have been in use in India since at least the third century B. C. They were employed in the minor rock-edicts of Asoka the Great (256 B. C.). In modern times, the numerals are wrongly known as "Arabic" because the European nations got them from their Saracen (Arab) teachers.

The decimal system was known to Aryabhata (A. D. 476) and Brahmagupta (A. D. 598—660) and fully described by Bhaskaracharya (A. D. 1114). In Subandhu's "Vasavadatta," a Sanskrit prose romance (A. D. 550—606) the stars are described as zero. In "Vyasa-bhasya" also, the system is referred to. The transformation of substance in chemical fusion through the "unequal distribution of forces" is there illustrated by a mathematical analogy : "Even as the same figure '1' stands for a hundred in the place of hundred, for ten in the place of ten, and for a unit in the place of a unit." The "Vyasa-bhasya" cannot have been composed later than the sixth century A. D. The decimal system was therefore known to the Hindus long before its appearance in the writings of the Arabs or Graeco-Syrians.

The Saracens learnt from the Hindus both the system of numeration and the method of computation. Even in the time of Caliph Walid (705—15) the Saracens had to depend on alphabetical symbols. They had no figures for numbers yet. A Hindu scientific mission reached Mansur's court from Sindh in 773. This introduced the Moslems to Hindu astronomical tables. The Saracen astronomical work thus compiled was abridged by Musa, the Librarian of Caliph Mamun (813—33). "And he studied and

communicated to his countrymen the Indian compendious method of computation, *i. e.*, their arithmetic and their analytical calculus."

This was the first introduction of the decimal system among the Saracens (830). They have ever since acknowledged their debt to the Hindus. Alberuni (1033) wrote: "The numeral signs which we use are derived from the finest forms of the Hindu signs"

It was probably in the XIIth century that the Europeans learnt this Hindu science from their Saracen masters. Leonardo of Pisa, an Italian merchant, was educated in Barbary, and thus became acquainted with the so-called Arabic numerals and Musa's work on Algebra based on the Sanskrit. In 1202 was published his "Liber Abbaci". This was the beginning of modern arithmetic in Europe. The pioneering work may have been done by Gerbert, a Frenchman, who learnt the Hindu system from the Mohammedan teachers at Cordova in Spain (C. 970—80). Musa, the distinguished Moslem mathematician, was thus the connecting link between the algebra and arithmetic of the Hindus and the mediæval European mathematics.

Let me conclude, by quoting two extracts from the writings of two eminent authors: "It is remarkable to what extent Indian mathematics enter into the science of our time. Both the form and the spirit of the arithmetic and algebra of modern times are essentially Indian and not Grecian. Think of that most perfect of mathematical symbolisms, the Hindu notation, think of the Indian arithmetical operations nearly as perfect as our own, think of their algebraic methods and then judge whether the Brahmins on the banks of the Ganges are not entitled to some credit. Unfortunately some of the brilliant of the Hindu discoveries in indeterminate analysis reached Europe too late to exert influence they would have exerted, had they come two or three centuries earlier." (Cajori).

There was hardly any difference between Europe and Asia at the time of the French Revolution (1789). The real and only cause of the parting of ways between the East and the West, nay, between the mediæval and the modern, was the discovery of steam, or rather its application to production and transportation. The steam-engine effected an industrial revolution during the first three decades of the XIXth century. It is this revolution which has ushered in the "modernism" of the modern world in social institutions, science and philosophy, as well as brought about the supremacy of Eur.-America over Asia.

The year 1815 may be conveniently taken to be the year I of this modernism, as with the fall of Napoleon it marks also the beginning of a new era in world-politics, practically the era in which we still live. The difference between the Hindu and Eur.-American, or between the East and the West, is a real difference to-day. But it is not a difference in mentality or "ideals" or so-called race-genius. It is a difference of one century, the wonderful century "in a more comprehensive sense than Wallace gives to it."

PARALLEL STRAIGHT LINES.

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In teaching Geometry there are certain imperfections that baffle the efforts of a teacher to give a clear idea about them to beginners so as not to confuse later logical development. The treatment of 'Parallels' says Lobatschewsky " belongs to these imperfections and he considers that the absurdity in the fundamental concepts of the geometrical magnitude and in the manner and methods of representing, and measuring of these magnitudes and finally the momentous gap in the theory of parallels to fill which all efforts of mathematicians, says he, " have been so far in vain " and therefore the theory of parallels should not lose its claim to the attention of geometers. The theory of parallels has been treated.

1. On the lines of Euclid which assumes the following definition of parallel straight lines :—

" Parallel straight lines are straight lines which being in the same plane and being produced indefinitely in both directions do not meet one another in either direction." And the following axiom known as 12th axiom or the 5th postulate of Euclid :—
" That if a straight line falling on two straight lines make the interior angles on the side of it less than two right angles, the two straight lines if produced indefinitely meet on that side on which are the angles less than two right angles ", or the Playfair's form of it which runs as follows :—" Two intersecting straight lines cannot be both parallel at the same time to a given straight line."

2. On the lines advocated in modern times we may classify under three groups practically all the definitions of parallel straight lines that have been given, even though they have a good deal in common and some of them lead easily to the other.

(a) Parallel straight lines have no point common, under which general conception the following varieties of statements may be included :

- (i) they do not cut one another, i.e., they are non-sectional lines,
- (ii) they meet at infinity, or
- (iii) they have a common point at infinity.

(b) Parallel straight lines have the same or like direction under which class of definition we may include all definitions that introduce transversals and assume the following axioms of parallelism :—

- (i) When two parallel straight lines are cut by another straight line, if a pair of corresponding angles are equal the two straight lines are parallel.

- (ii) When two parallel straight lines are cut by another straight line the corresponding angles so formed are equal.

3. Parallel straight lines have the distance between them constant, with which we may group the attempt made to explain a parallel as the geometrical locus of all points which are equidistant from a given straight line.

The assumption of the XII axiom of Euclid had been a subject of controversy from the very beginning. Even Aristotle observed that "there is nothing surprising in different hypotheses leading to the same error as one might conclude that parallels do not meet from the assumption either (a) that the interior angle is greater than the exterior angle or (b) that the angles of a triangle make up more than two right angles."

Even the earliest commentators on Euclid's Text held that the axiom of parallels was not sufficiently evident to be accepted without proof and they attempted to deduce it as a consequence of other propositions. In order to succeed in their attempts they endeavoured to introduce new definitions of parallel lines in place of the Euclidian definition given in a negative form.

Prosidonius, one of the earliest geometers, defined the term as follows :—

"Parallel lines are those which being in one plane neither converge nor diverge but have all the perpendiculars equal which are drawn from the points of the one line to the other while such straight lines as make the perpendiculars less and less continually do converge to one another."

What this amounts to is that parallel straight lines are those which when produced indefinitely both ways the distance between them or the perpendicular drawn from either of them on the other is always equal and not different, and has sown the seeds of modern geometry from the view point that parallels are everywhere equidistant or that a parallel is the locus of a point which moves such that its distance from a straight line is constant.

This axiom, says Proclus, "ought even to be struck out of the postulates altogether" because it is a theorem involving many difficulties and requires for its demonstration a number of definitions and theorems. This statement is further strengthened by the fact that even Euclid proved the converse of it, i.e., the sum of any of the angles of a triangle is less than two right angles (1—17). Thus we see the assumption of Euclid's XIIth axiom has led us into troubled waters and countless successive attempts have been made through more than twenty centuries to prove the postulate, many of them by geometers of ability such as Ptolemy, Proclus, Lambert, Gauss, Legendre, and all of them have failed to give a logical proof of the axiom.

Further development was made in the theory of parallels when Playfair changed the XIIth axiom of Euclid thus :—

“ Two intersecting straight lines cannot both be parallel at the same time to a third straight line ”, which really supposes implicitly that lines which point to different directions cannot at the same time point to the same direction.

Thus we see that the very fact that the innumerable attempts made to obtain a proof did not lead to the wished-for result would suggest the thought, says Bonola, an Italian mathematician, that “ its demonstration is impossible.” Indeed our geometrical instinct seems to afford us evidence that a proposition seemingly so simple if it is provable, ought to be proved by an argument of equal simplicity. But such consideration cannot be held to afford a proof of the impossibility in question.

If we put Euclid's postulate aside, following the developments of Gausee, Lobatschewsky and Bolyal we can construct a geometrical system in which no contradictions are met. This seems to prove the logical possibility of the Non-Euclidean hypothesis and that Euclid's postulate is independent of the first principles of the geometry and therefore cannot be demonstrated.”

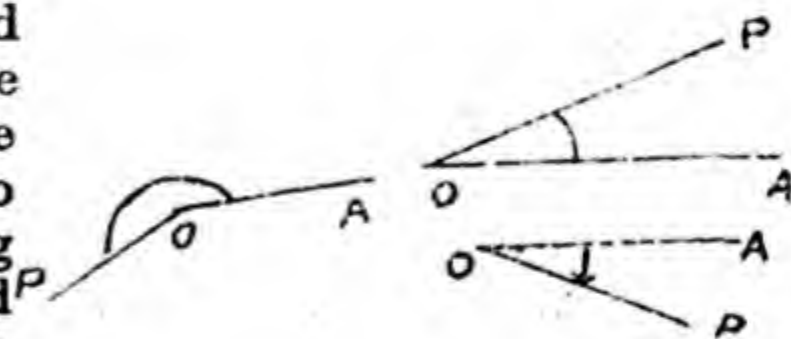
Now let us try to discuss the theory of parallels from the view point of modern geometers. The varieties of the group that regard parallels as lines (a) meeting at infinity or (b) having a common point at infinity are at least, says Heath, unsuitable definitions for elementary text-books. It is very difficult for us as well as for beginners to have an idea of infinity or lines cutting at infinity, for a finite man cannot claim to regard the infinite as something that can be grasped by ordinary means of observations. For the beginner it is very difficult to grasp the idea because he cannot understand that a railway train moving on parallel rails will not be able to stand on them at infinity (whether he can see it or not makes no difference) because the two rails which are parallel must meet at infinity. This is beyond his conception. There is no doubt that higher geometry has to assume that lines do meet at infinity, whether such lines exist in nature or not, just as we assume and deal with “ straight lines,” although there is no such thing in space as straight lines. Here the business of a teacher is to explain the theory of parallel so as to lead the boys to understand the higher meaning of things he has to learn in his later years, by drawing his attention to the point that the vertical lines drawn on the walls of a room or the vertical edges of a black-board or the lines of thread with weights attached to them (which are all parallel) pass through the centre of the earth which is at an infinite distance a relative term by associating it with the idea that the earth attracts all bodies towards its centre (law of gravitation); similar in point is the example of the rays of the sun which are parallel but are

emanated from the same point on the sun's surface. Another illustration which a teacher of geometry can give is from the following propositions:—

The external bisector of an angle of a triangle divides the base externally in the ratio of the sides; when the triangle is isosceles.

The Direction Theory.—The notion of direction is primary and not a derivative one and is acquired by a boy by intuition and race-impression like all primary notions such as distance, time and space. We can only illustrate what we mean by direction by reference to the four cardinal points, North, South, East and West, and further to other points of the compass. Thus we see that lines meeting at a point have different directions, and in order to develop the idea of parallels from the direction we have to explain a few fundamental ideas about (i) the sense of a line, (ii) the formation of an angle, (iii) the motion of translation, (iv) the motion of rotation. It is obvious that we can travel along a straight line in either of two opposite directions, viz., from A to B or from B to A. In order to understand clearly the idea of direction it is important to distinguish between these directions or senses line. We can do so most conveniently by the order of letters used in naming the line. Thus AB and BA will represent the opposite senses of the line AB.

The angle, sometimes defined as the difference of directions, is the amount of turning of a line from a position of rest about a point. Thus if OA is the position of rest and that OA has assumed the position of OP, then the amount of turning AOP is the angle formed. There are two directions in which the turning can take place. Clockwise and Contra-clockwise. If it turns contra-clockwise then it describes a positive angle and if clockwise a negative angle.

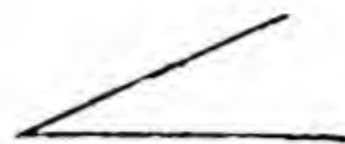


The motion of translation means that a body can be moved from one place to another place without changing its position, shape and form. Thus if a set square moves along the straight edge of a ruler it represents the motion of translation.

The motion of rotation means that a body turns round a point like a top or like the ox at a Persian wheel. Now to understand clearly that parallel lines are those lines which have

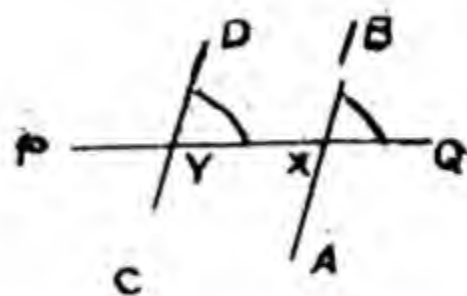
the same direction ; we may see how the direction of a line with respect to a fixed line varies.

Thus OA changes from OA to that of OB and is measured by the angle AOB, i.e., the greater the angle, the greater is the change of direction ; and the direction OB with respect to OA is fixed by the angle AOB.



The test whether two straight lines have the same direction may be illustrated thus :—

AB and CD are two straight lines and a third straight line PQ is drawn to cut AB and CD at X and Y. The direction of AB is fixed by the angle QXB and the direction of CD by angle QYD and if these angles are equal the lines AB and CD have the same direction. Hence we have the following two axioms of parallel lines :—



1. When two straight lines are cut by another, if a pair of corresponding angles are equal, the two straight lines are parallel.

2. When two parallel straight lines are cut by a transversal the corresponding angles so formed are equal.

Objection No. 1.—In these days in the teaching of various subjects of school education is it possible to avoid teaching that plumb lines point towards the centre of the earth ? Is a clear notion of parallels possible to a boy who is told in a geometry lesson that vertical lines are in the same direction and so are parallel, but who, half an hour later, in a geography or practical mechanics lesson is told that vertical lines all point towards the same point, i. e., the centre of the earth. Will such a boy always avoid thinking that straight lines pointing towards the same point are in the same direction ?

This objection of course seems to be very sound and will produce confusion in the mind of the beginner and create in his mind that the facts taught in mathematics, a perfect science, are contrary to the facts of our everyday life. Deeper thought will clear the point and explain this mathematical paradox.

The definition of a term for a beginner ought to be such as can be developed as a boy advances in his studies and learns new facts. As the boy advances, he learns that the equations of the first degree in X and Y represent straight lines and the solution of these equations will give the point of intersection of these

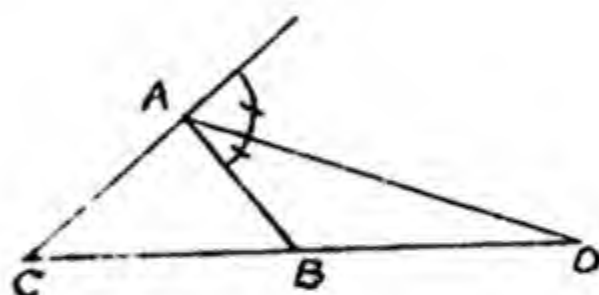
lines. For example $ax+by+c=0$ and $ax'+by'+c'=0$ represent two parallel lines and their point of intersection is given by the solution of these equations. By Rule of Cross-multiplication we have :—

$$\frac{X}{bc' - b'c} = \frac{Y}{a'c - ac'} = \frac{1}{a'b - ab'} = \frac{1}{0} \quad \text{or } x = \infty$$

and $y = \infty$, meaning thereby that parallel lines meet one another at infinity. The interpretation of the solution of these equations will be supported by the illustration that now appears to be against the theory, i.e., all vertical lines (which are parallel) intersect one another at the centre of the earth which is at an infinite distance.

The same fact can also be elucidated by the following geometrical illustration :—

In any triangle ABC if AD is the external bisector of angle A meeting CB produced at D, then, $BD : CD : AB : AC$. This result is true for all triangles, but in case of an isosceles triangle when $AB < AC$ the result does not hold good because then $BD = CD$, i. e., a part becomes equal to the whole. A little con-



sideration will show that this result is only true when the values of BD and CD become infinite, i. e., AD meets BC at infinity or in other words, it is only true if AD is parallel to BC. This is an established fact that the external bisector of the vertical angle of an isosceles triangle is parallel to the base. Hence we see the objection that is levelled against the theory of the parallels having the same direction will only help to elucidate the point rather than being against it.

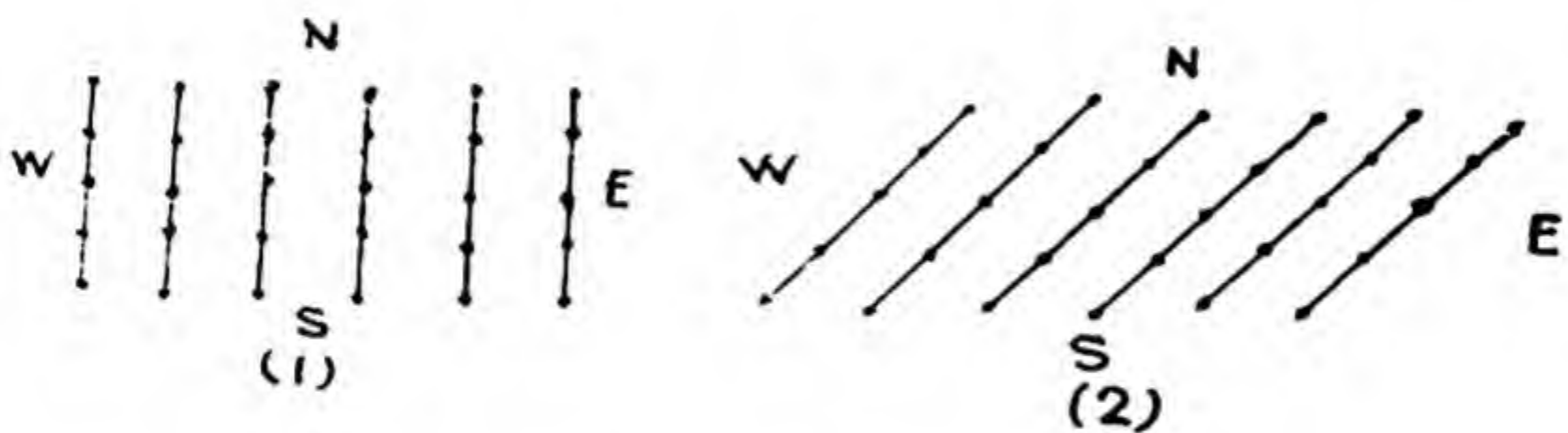
Further explanation can be given of these geometrical facts on the assumption of Euclid's definition of parallel straight lines.

2nd Objection.—Dodgson in his books "Euclid and his modern Rivals" remarks as follows :—

As Gauss said, "If it (identity of direction) is recognised by the equality of angles formed with one-third straight line, we do not yet know without an antecedent proof, whether this same equality will also be formed in the angles formed with a fourth straight line," and in order to make this theory of parallels valid, so far from getting rid of axioms such as Euclid's you would have to assume as an axiom which is much less axiomatic, namely, that "straight lines which make equal corresponding angles with a certain transversal do so with any transversal."

These axioms can practically be illustrated by the following illustrations :—

1. The distant signal post at a railway station has two parallel horizontal bars attached to a vertical stand. They are both pointing in the same direction. When the train is to pass through the station they are lowered, i. e., they are turned through the same angle and retain the same direction and are parallel.
2. When a class of 30 boys is standing divided into six lines 5 deep facing, say, east, there are six lines all parallel to one another in the direction N—S. On the order 'half-right form' being given each line of five will pivot on the boy at the south end of the line, until each line gets into a NE—SW direction. This can be represented graphically :—



All the lines turned through an angle of 45 degrees, hence we see the truth of axioms illustrated graphically.

No doubt that the axioms assumed in this case are also not self-evident. We are to see which axiom can easily be explained to the beginners. But when we are to choose between two evils we should choose the lesser evil. As evident from the illustrations given above it is easier to proceed by assuming parallel lines as having the same direction and much of our work is simplified. I am of opinion that it may be adopted, if it is at all necessary to continue the old order of the proposition, in place of the old theory of parallels.

The opinion of DeMorgan, a great teacher of Mathematics, is adverse to the direction method. He says, "There is in it one great point which brings down all the rest, if it fail." That point is the treatment of an angle which amounts to this that certain notions about direction taken as self-evident, are permitted to make all about angles, parallels and all immediate consequences.

"What 'direction' is we are not told, except that 'straight lines which meet have different directions'. Is direction a magnitude? Is one direction greater than another? We should suppose so; for an angle, a magnitude, a thing which is to be halved, and quartered is the 'difference of the direction' of 'two straight lines that meet one another?'"

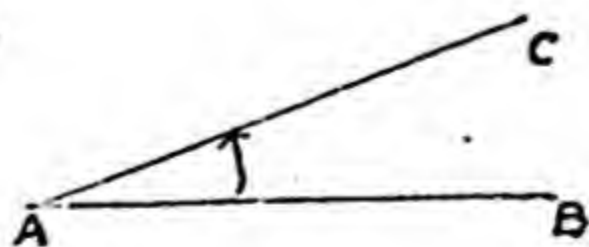
"Parallels, of course, are lines which have the same direction. It is stated as an immediate consequence that two lines which meet cannot make the same angle with a third line on the same side, for they are in different directions. Parallels are knocked over in a trice. There is a covert notion of direction, which though only defined with reference to lines which meet, is straight away transferred to lines which do not. According to definition direction is a relation of lines which do meet and yet lines which have the same direction can be lines which never meet.....How do you know, we ask, that the lines which have the same direction never meet? Answer: Lines which meet have different directions. We know they have, but how do we know that, under the definition given, the relation called direction has any application at all to lines which never meet.*

"Every demonstrative science" says Aristotle "must start from undemonstrative principles, therwise the steps of demonstration would be endless". We have to assume some fundamental concepts which cannot be proved or defined. Direction, like space, time and unit is, as I have already told you, a primary concept and not a derivative one. When we say intersecting straight lines have different directions, we do not define it, but illustrate the idea we have of direction, just as when we say a solid occupies space, then we do not say what space is but only illustrate our idea of space.

It is always possible to raise objection to reasoning from our side, but to contradict the reason within us is not always possible.

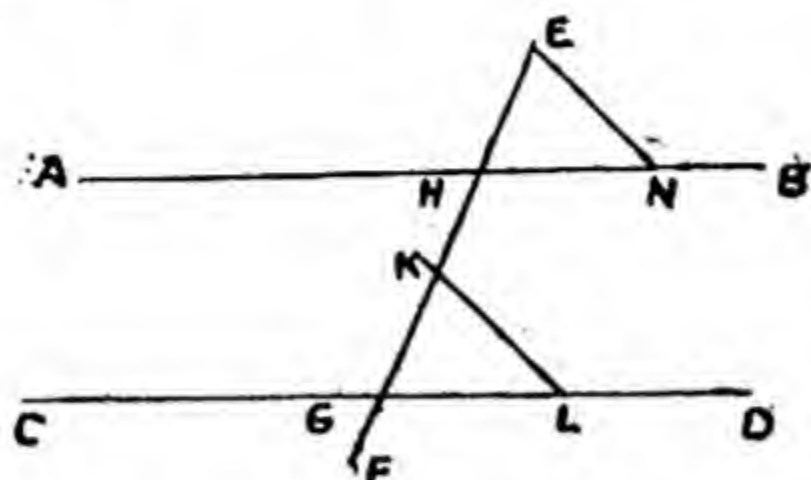
To illustrate the principle of direction an attempt is made to define parallel as:—

Lines that can be made to lie one over the other without any turning.



This assumes that if two lines AB and AC intersect at A, i.e., they have different directions, one must be turned round through angle BAC in order that one may lie over the other. But if we place one line over the other without giving it a rotation about a point then the lines are parallel.

Taking this definition of parallels we prove the truth of the two axioms assumed.



Let AB and CD be two straight parallel lines and EF cut them at G and H.

To prove that angle EHB = corresponding angle HGD.

Construction. Take $GK = HM$ and $GL = HN$.

Join MN and KL.

Proof. Slide the triangle KGL such that KG moves along the transversal FE till GK lies over its equal HM.

\therefore HN is parallel to GL. (Note motion of translation and compare the drawing of lines by a pair of set square.

\therefore GL will lie over HN without any turning. (No motion of rotation having taken place.)

Hence angle MHN = Cor. angle KGL.

Converse Theorem.

If angle HGD = Cor. angle EHB.

To prove that AB is parallel to GD.

Same construction as before.

Proof. Slide the triangle KGL such that KG moves along the transversal EF till GK coincides with its equal HM.

\therefore angle HGL = angle MHN.

\therefore GL will lie over HN without any turning.

Hence AB is parallel to CD.

In modern times, the conception of parallels as equidistant straight lines was practically adopted by Calvius and Borelli although they did not define them in this way. Before such a definition can be given it should be proved that the locus of a point is a straight line. Since the idea of locus is itself difficult

for the boys and is beyond their stage of development, therefore it is not a fit definition for an elementary text-book.

I have placed before you the different aspects of the theory of parallels stating the objection against each aspect with a view to arouse interest among teachers of mathematics so that they may give their earnest consideration to this vexed question. Nor do I hesitate to appeal to the teachers of geometry to give their consideration to this important principle at issue that the fundamentals in Geometry should be introduced in such a way as not to confuse later logical development. There is a tendency in modern times to consider it wise to increase the number of assumptions built upon suitable illustrations and practical work. Among such assumptions include the propositions dealing with parallels and take them, like hypothetical constructions, as true for logical development of the subject.

DEFECTS IN THE TEACHING OF MATHEMATICS AND REMEDIES.

BY L. GURAN DITTA MALL, B.A., B.T.,

Lecturer in Mathematics, Central Training College, Lahore.

1. In lower classes arithmetic is taught by means of formal lessons instead of *incidental* means through constructive occupations and games, e. g., clay modelling, paper cutting, paper folding and paper mounting, etc.

2. Almost all children feel it rather difficult to remember the rotation of numbers in 9 as ۲۹, ۳۹ etc. The difficulty may be removed by explaining to the students the meaning of اَوْن with its use in Punjabi اَوْن اَوْن, اَوْن اَوْن. Thus اَوْن means ۴ and اَوْن اَوْن means ۸, a little less than ۱۰.

3. Sufficient attention is not paid to drill in addition and subtraction tables. Multiplication tables are, also, learnt differently. These tables may be constructed by the pupil but should be so thoroughly learnt by him that he may reproduce any item without even the least possible effort.

4. At present, the accounts of co-operative societies form a part of arithmetic syllabus in the IV primary class. These accounts are really too difficult for the child, and at the same time, he has no natural interest in such accounts, at this stage. It is a very serious defect in our syllabus. These accounts may be expunged entirely from the course of the IV primary class and easy vulgar fractions and additions and subtractions of decimal fractions may be introduced instead. If desirable the accounts of the co-operative societies may be fixed for the commercial classes only.

5. The course in Geometry is not quite systematic. In the IV class, we have to teach areas of squares and rectangles and قد می پیموش. In the V class, there is no Geometry. In the VI class we have geometrical concepts and linear and angular measurements. In the VII class, we have a few geometrical truths to be established empirically and a few constructions, and in the VIII class, areas of squares, rectangles, right-angled triangles, parallelograms, triangles, trapezium, areas of figures on squared paper, areas of polygon, circle, sector, segment, proportion and similar figures and volumes of cube, cuboid, prism, pyramid. I propose to arrange the course as below :—

IV Class.—Use of set-squares and foot rules in drawing and measuring lines correct up to 1", drawing parallels, and parallelograms. Use of compasses in drawing circles.

V Class.—The concept of an angle, measurements of an angle by paper-angle, idea of a right-angle, acute angle, obtuse angle, construction of a right angle by set squares as well as compasses.

VI Class.—Construction of square, rectangle, right-angled triangle, any triangle, parallelogram with their areas, area of figures on squared paper.

VII Class.—To establish empirically or experimentally truths about (1) angles at a point, (2) properties of parallel, (3) angles of a triangle, (4) angles of a polygon, (5) sufficiency of data for the construction, and congruence of triangles, (6) properties of isosceles triangle and kite, (7) idea of similar figures, simple cases of scale drawing, (8) determination of heights, distances of objects both accessible and inaccessible by means of home-made apparatus such as a quadrant, horizontal sighter, and measuring tape. The last part of the syllabus is extremely important, and inspecting authorities should see that *it is done without fail*.

VIII Class. Inverse rules of areas of rectangle and square, right-angled triangle, Pythagoras' theorem, parallelogram, etc. Area of trapezium, use of squared papers in finding areas, area of polygon, circle, sector, segment, relation between sides and areas of similar triangles, diagonal scale, volume of cube, cuboid prism, etc.

6. Approximation. The principle of approximation may be encouraged as early as possible, especially in first four rules of decimal fractions, in practice, in compound interest by decimals and contracted methods of multiplication and division.

As a pie has practically no value, and is not a current coin, its frequent use in text-books may be abandoned, but its use in exercises on the calculation of railway fare and income tax may

be retained. In most of the exercises, answers should be determined correct up to a pice or an anna. Students may be encouraged to estimate roughly the answer of problems before actually doing them on paper. This device will serve as a great check against absurd answers which sometimes students give.

7. Choice of Methods. It would be extremely useful to encourage children to do a sum by as many different methods as possible, and then to choose the shortest, for example, $\frac{5}{8}$ of Rs. 12 6 as. 2 pies can be done in two ways :—

First method.—To reduce Rs. 12 6 as. 2 pies to a fraction of a rupee, to multiply that fraction by $\frac{5}{8}$, and to reduce the result into Rs. as. pies.

Second Method.—To divide Rs. 12 6 as. 2 pies by 8 and to multiply the result by 5.

Again a problem may be done arithmetically as well as algebraically and in some cases by practice, by unitary method or rule of three, etc., etc.

8. Mental Mathematics.—The students should be given sufficient exercise not only in mental arithmetic, but in mental algebra and geometry as well. At present, very little attention is being paid to this side of the subject.

9. Contracted methods of multiplication and division are extremely useful, and they are entirely neglected.

10. Time given to Mathematics in the middle department is only 6 periods per week. This is quite insufficient. Time given to English is 12 periods a week. I propose to raise the time for Mathematics from 6 to 9 periods a week and correspondingly reduce English periods from 12 to 9 a week, which may again be compensated by improved methods of teaching the modern foreign languages.

11. From the papers which I have received from various schools, dealing with the defects in the teaching of Mathematics, I gather that all feel the pain somewhere and make various proposals. All are conscious of the fact that the teaching of Mathematics in schools is far from satisfactory. It is difficult to enter into all the details, when the time at my disposal is so very short, but I think that if the following suggestions will be accepted, the teaching of Mathematics will considerably improve in our schools :—

At the age of 10, the child *begins* to analyse situations and if he is really intelligent by the age of 12, he acquires sufficient efficiency in the analysis of a complex situation. Therefore, if we introduce an examination in Mathematics, after the VII class,

and set fairly difficult problems in that test, we shall be able to classify students into two types :—

1. Those who have got no aptitude for Mathematics, such students may be allowed to take the *minimum* course containing arithmetic, mensuration, very easy sums in algebra, simple factors and solution of problems by equations for their matriculation.

2. Those who have got special aptitude for Mathematics, they may have the present course plus the use of logarithmic tables and elementary or numerical trigonometry.

The present system is extremely vicious, for it takes no account of the difference in intelligence and aptitudes of boys and girls. In support of this proposal I may tell you that in England, they hold a public examination at the age of 12, which is fairly stiff, and they classify children according to their aptitude, and really intelligent boys are allowed to take special course in Mathematics.

12. *Assignment.* The right method of teaching Mathematics, after the age of 12 or 13 (i.e., in VIII, IX, X classes)—when the child enters into the stage of adolescence, becomes more self-assertive, more social, acquires the sense of responsibility and is capable of analysing complex situations—is the assignment method. There is no school subject which adapts itself so readily and so nicely to it as Mathematics. I propose that steps may be taken to encourage the introduction of the Assignment system in teaching Mathematics from the VIII Class.



THE INTRODUCTION OF LOGARITHMS IN THE HIGH CLASSES OF SCHOOLS.

BY LALA MEHR CHAND SURI, M.A.

When my friend Mr. Guranditta Mal asked me to prepare a paper for this Educational Conference, I gladly accepted his invitation. I have no hesitation in asserting that the introduction of the teaching of Logarithms into the high classes of our schools is to my mind a reform which has long been overdue. And for this reason, I would have liked to see an abler and more influential person speaking before this Conference on this subject. But as there was very short time left to find such a one and as I did not like to embarrass my friend the Secretary, I decided to respond to his kind invitation to the best of my ability.

The marvellous invention of Logarithms which has immortalised the name of John Napier in the history of scientific thought is to my mind one of the best labour saving machines ever invented by man. It was a wonderful thing to replace the

processes of multiplications and divisions by those of additions and subtractions, but it was even a greater and a more wonderful thing to replace root extraction by division. I remember the day when I first saw a 7-figure table of logarithms and was shown how to use it. My feeling of amazement at what it could do is a fresh and vivid memory to me. I had not yet studied the theory of logarithms, but knew how to find the square and the cube roots. I cannot describe to you the great wonder and joy I felt when I saw that the table before me could replace the tedious and irksome extraction of the square and cube roots by the far simpler operations of division by 2 and 3. And ever since both as a student and as a teacher I have admired more and more the table itself as a grand and magnificent achievement of the human mind, applying, with such wonderful effect, mathematical principles to the general service of mankind.

Napier has certainly laid the world of Science and practical life under an eternal obligation to him and has, therefore, claims to the continued gratitude of mankind.

It always gives me peculiar pleasure and satisfaction to show respect and honour where they are due and I would therefore have liked very much to speak at some length of the greatness of Napier's intellect and his grand achievement, of the profound influence which his discovery has had on the whole method of calculations and of the immense benefits which it has conferred on Science and the World, but time is short. I must, therefore, come straight to my subject which as previously announced is "The introduction of the teaching of logarithms into the high classes of our schools."

There are two different aspects from which it may be determined whether a topic should be included in the school course or not. The first of these is the educational aspect, the efficacy of the topic as a mental training, as a method of thinking, as an attitude of the mind. That is, does the teaching of the special topic give the scholar a special intellectual discipline not so well obtained from the teaching of other subjects? Does it demand of the pupil, thought, investigation, analysis, synthesis, reasoning, deduction, etc.? The second one is the utilitarian aspect, the applicability of the topic in the every day practice of life. That is, does its teaching demand of the pupil rapidity, accuracy, skill, insight and common sense? Educationists differ as to which of these aspects is primary and which only secondary. My own opinion is that each is essential to the other and I believe that really valuable mental discipline may be obtained from the proper treatment of a topic of an essentially utilitarian kind. Here I may, just by the way, say a word to those friends who, even in the 20th century think that the utilitarian point of view should be absolutely disregarded in the education of our young men and young women. I want to tell them, very respectfully

though, that they are very much behind the times. Let them not forget that methods employed to render any acquired knowledge useful are more truly educative than those that merely aim at the acquisition of knowledge with no thoughts of its utility. Let them realise that the wonderful progress which the world has made in different directions during modern times is very largely due to the emphasis it has laid on the question "What is the use?" Utilitarian point, therefore, is an important point and no individual or nation who cares to hold its own in the rapidly changing world of to-day can afford to ignore it.

Logarithms, however, looked at from any one of the above standpoints, Educational or Utilitarian, may be mentioned as a topic which deserves special emphasis. In Europe and America the teaching of this subject to boys of average age from 12 to 15 has long passed the experimental stage and logarithms have for many years been admitted as a fit subject for teaching in the schools.

In the series of papers on "The Teaching of Mathematics in the United Kingdom" published as long as 15 years ago by the "Board of Education" for the International Commission on the teaching of Mathematics there is a paper by Mr. C. Godfrey on "The Algebra Syllabus in the Secondary Schools" in which he insists, and rightly so, on our regarding the introduction of the calculus as the ultimate end of the teaching of Algebra. Thus we find that whereas attempts are being made in all other parts of the civilized world to introduce the elements of Trigonometry and the Calculus in the Schools, we have here to read papers on the advisability of introducing Logarithms into the High Classes of our Schools.

Now we all know that the theory and practice of logarithms is naturally a part of the study of exponents and does more than anything else to give the subject of indices a real meaning. Is it not a pity, therefore, that in our province the two are ever divorced?

For the sake of those who are not familiar with Logarithms, I will, with your permission, Mr. Chairman, say a few words by way of explanation before I proceed further.

Here I have written down powers of 2 from 2_1 to 2^{20} .

$$\begin{array}{lcl} 2^1 & = & 2, \\ 2^2 & = & 4, \\ 2^3 & = & 8, \\ 2^4 & = & 16, \\ 2^5 & = & 32, \\ 2^6 & = & 64, \\ 2^7 & = & 128, \\ 2^8 & = & 256, \\ 2^9 & = & 512, \\ 2^{10} & = & 1,024. \end{array}$$

$$\begin{array}{lcl} 2^{11} & = & 2,048, \\ 2^{12} & = & 4,096, \\ 2^{13} & = & 8,192, \\ 2^{14} & = & 16,384, \\ 2^{15} & = & 32,768, \\ 2^{16} & = & 65,536, \\ 2^{17} & = & 131,072, \\ 2^{18} & = & 262,144, \\ 2^{19} & = & 524,288, \\ 2^{20} & = & 1,048,576. \end{array}$$

Consider the following questions :—

$$1. \quad 256 \times 2048 = 2^8 \times 2^{11} = 2^{19} = 524,288,$$

$$2. \quad \frac{262144}{64} = \frac{2^{18}}{2^6} = 2^{12} = 4,096$$

$$3. \quad \sqrt[5]{32,768} = \sqrt[5]{2^{15}} = 2^3 = 8$$

etc., etc., etc.

In the equation $2^{12} = 4,096$

2 is called the base and 12 is the logarithm of 4,096 with respect to the base 2.

Thus we see that if we want to have a table which would enable us to multiply together numbers without actually performing the operation, they must not be represented as resulting from continuous addition as in the Hindu or Roman Notation, but as resulting from continued multiplication. Thus if we could represent all the numbers that we wanted to use as being powers of one and the same number, say of 10, then to multiply them together we should only have to add the indices of those powers. But on reflection such a representation seems very uninviting from the practical point of view. For if we pass from one number to the next by some uniform factor the gap between them as in the series of powers of 2 will become larger and larger and therefore the possibility of representing, in this way, all numbers that we may want to use, more and more remote. How Napier worked at this idea for 20 long years before he gave actual tables to the world is a wonderfully fascinating story. But I must resist the temptation of telling it and pass on and deal with the objections which probably will be raised in different quarters against the introduction of the teaching of logarithms into the High Classes of our Schools.

The first objection will be perhaps something like this.

The course in Mathematics for the Matriculation students is already fairly heavy and requiring him to learn another Chapter on Logarithms means a strain on him which he will not be able to bear.

Answer.—We all know that on account of our boys' familiarity with the index notation, it is so easy to teach him the properties of logarithms, all propositions being the direct consequences of the definition. Thus to prove any proposition in logarithms all that is necessary is to translate equation to the exponential form. The moment you write the hypothesis and the conclusion in the exponential form, the proof becomes obvious.

For example, defining logarithms as follows :—

Choose a number $a > 1$, as the base or number of reference if x and N are numbers connected by the relation $a^x = N$, then x is called the logarithms of N to the base a and is written $x = \log_a N$.

To prove $\log_a N + \log_a M = \log_a MN$.

Suppose $\log_a N = x$, $\log_a M = y$.

We have to show $\log_a MN = x + y$.

or from $a^x = N$ and $a^y = M$.

We have to show that

$$a^{x \text{ plus } y} = MN$$

which is obvious.

Similarly about other properties.

Thus the first thing to understand is that logarithms are so easy to learn when properly taught.

My second answer to the objection is this :

I believe, and I am sure you all agree with me in believing, that the Indian boy, provided equal opportunities are given, is in no way inferior to his brother in Europe and America and, therefore, I do not see any reason why we should not expect and help him to know that his brother in the West knows at his age. And if there be some teachers who still feel that the introduction of Logarithms will mean a really heavy addition to the mathematical course in the Matriculation, I would respectfully request them to throw overboard all mathematical lumber in the shape of long and involved calculations, long reductions, useless and unfamiliar weights and measures, complicated vulgar and decimal fractions, useless mathematical tricks and dodges, in fact all the different types of artificial sums which continue to disfigure the pages of many a text-book. When this is done there will result such a wonderful saving of time that the addition of logarithms in the course will not be felt by any one concerned.

The second objection as I can see it will be something like this :—

The young boy at school is not able to understand a logical treatment of the theory of irrational numbers and irrational exponents, and as logarithms are mostly irrational numbers, they should not, therefore, be included in a school course.

My answer to this is that I am not advocating that the school boy should be taught any rigorous theory of irrational numbers, such as Dedekind's definition and treatment of them; nor even that he should be told that there are two kinds of irrational numbers, algebraic and transcendental. But only this : that *he should know enough about the properties of logarithms to enable him to make an intelligent use of the tables.* And again who

can deny the fact that every boy in the high classes is familiar with irrational numbers and frequently uses them $\sqrt{2}$, $\sqrt{3}$ are irrational numbers and everybody knows that for purposes of practical reckoning, no matter how exact, an irrational number may be represented by a rational one. The same remarks apply to logarithms as irrational numbers. Irrational, however, is a very unfortunate name, I think, for it was only after the introduction of these so-called irrational numbers that Mathematics became rational.

The third objection will perhaps be this.

The boy at school cannot learn how to construct a table of logarithms, why therefore should he be allowed to use them at all?

This objection is much too wide of the mark. I have never seen anybody so unreasonable as to object to the use of a watch by one who has not, will not and perhaps even cannot learn how to construct one. In fact the poor and miserable state of society can be better imagined than described, if everybody were forbidden the use of things which he or she did not know how to make.

Ladies and gentlemen, I think I should not leave the subject before considering a possible fourth objection which only yesterday a friend communicated to me. This is what he said. The work of multiplication and division, the calculation of compound interest, etc., will after the introduction of logarithms become so easy that it will not give the students enough difficulties to surmount.

The objection does not appear to me to be a real one. There are sufficient real difficulties to be overcome and one need not go out of the way to invent fictitious ones. And in the high classes before reaching which the student has had sufficient drill in multiplication and divisions, I strongly feel that the difficulties which he is required to surmount should be of the mental type rather than the mechanical. Here attention should be paid to Principles and from the beginning to the end the course must be an exercise in clear thinking.

Another point to which I would like you to give your careful thought is this. Many of our boys after passing the Matriculation examination leave their studies and some of them even become teachers. Do we or do we not want them to go out into the world better equipped than at present? I personally would like to see that our boys when they finish their school course, should not only be able to do ordinary calculation and computations with reasonable speed, but that they should also be familiar with the various labour-saving devices, the chief among which are logarithms.

Having now finished the task set before me, I want to say a word about the real difficulties in the teaching and study of mathematics.

The first real difficulty is the insufficient supply of competent teachers, as was very ably pointed out by R. B. L. Atma Ram in his presidential address. It is a pity indeed that in the high classes of many schools, the teachers of Mathematics are not specialists in their subject. The young man who has sufficient ability to do well in a higher course of Mathematics can without much difficulty supplement his academic studies in the direction most profitable to him as a teacher. The only important thing in his case is that he should learn to understand and feel sympathetically with the earlier stages of intellectual development.

It is desirable therefore that a pass degree with A and B Courses of Mathematics should be taken as a minimum qualification for the training of teachers in Mathematics and the educational authorities be requested to keep this in view when they fill appointments.

The second difficulty is that of the really good text-book. Being curious to know how the current text-books deal with indices and the theory of indices, because they have such an intimate connection with Logarithms, I looked at about a dozen books used as texts in our schools. I was struck with the defective treatment and the loose reasoning used in most of them. The question as to whether a statement is true for all values of the letters concerned was disregarded by most of the writers. For example, in assigning a meaning to X none of them said the only correct thing, which is, for all values of X , *except zero*, we define X^0 as 1'. If X is zero, X^m which is also zero cannot be used as divisor, we are therefore unable to assign a definite meaning to 0^0 .

The case in which $X=0$ has as a rule been disregarded.

The third and perhaps the most important difficulty in the way of proper teaching of Mathematics is the wide influence which the examinations exert on it. Thus on one hand we find that since so much importance is attached by authorities to pass percentages, the passing of examinations is becoming very nearly an art. Some clever teachers have already begun by a careful and judicious study of the papers of the previous 3 or 4 years, to forecast the probable questions to be set, the answers to which the poor boys are asked to memorize and on the other hand one finds that such artificial questions have begun to appear in the papers which do not at all aim at determining the knowledge of the students and whose only excuse for figuring in the examination paper is that they are a source of irritation to the clever and despair to the slow boys of our schools. I have mentioned these facts because I thought it fit to call the attention of this Conference to some of the real difficulties.

HEALTH OF SCHOOL STUDENTS.

By DR. PREM NATH SURI, M.R., C.P. (EDIN.); D.T.M.R. (ENG.)

In a Conference composed of educationists and medical men, it is hardly necessary for me to dwell on the importance of the health of students to a community or to a nation. Nor is it necessary for me to emphasize that education *per se* has no injurious influence on health, and the bad health of many school children is entirely due to the unhygienic environment at school and at home. No efforts had been made in the Province to survey the problem of school health till 1910, when Dr. G. I. Batra working under the auspices of the Society for the propagation of Scientific Knowledge, Lahore, instituted voluntarily the medical inspection of students of some of the local colleges. The Punjab Government in 1916 appointed Medical Inspectors of Schools, but on account of the exigencies of the Great War they had to be taken away a couple of years after, and since then, I believe, no systematic efforts have been made to inspect, far less to improve the health of the students, although the conditions revealed by the earlier medical inspections were serious beyond all expectations. That over fifty per cent. of our school-boys should be suffering from some disease, deformity or defect is a sufficiently serious position to demand our most earnest attention. It will not do merely to blame the ignorant home surroundings, or to put the whole blame on school authorities and to curse them for multiplicity of subjects, unsuitable school hours, over pressure, etc. The problem has to be faced boldly though sympathetically and the circumstances influencing health, whether at school or at home must be carefully examined. For this, the close co-operation of the teacher and the parent is an absolute necessity.

The two chief causes underlying this grave situation are the poverty of the people and the ignorance of the parents and the teachers. Poverty and ignorance work in a vicious circle. The educated community have so far taken up a *laissez faire* attitude and have failed to perform their only duty in the matter. The devil-may-care policy has to be replaced by a burning desire to improve the present deplorable condition. In the short space of fifteen minutes, one can hardly indicate the main lines on which work should be carried on.

1. The teacher must be more efficiently trained in the elementary principles of hygiene. It is of course impossible to expect better results from so poorly paid a staff as is found in most primary schools.

2. In the lower classes, at any rate, it is not necessary to teach the theory of hygiene, but the *children should be trained in healthy habits*, by example and precept. Thus the teacher can see that the children are cleanly dressed, have brushed their

teeth, etc., and any one found not to be in a fit condition can be sent home for proper cleansing. He can also see that the class room is properly dusted, the skylights opened, the seats and the black-board properly arranged, etc. These little things create an atmosphere which has a permanent effect upon the students.

3. In the higher classes of the schools, when the boys can understand the why and wherefore of things, the teaching of principles of hygiene should be systematically begun. In the two highest classes Hygiene should form a compulsory subject. In this way a rational foundation for the creation of the hygienic atmosphere will be laid.

4. The education of the home must go hand in hand with the improvement in the school. This can be done by the organisation of lectures (for men and women), illustrated by lantern or cinema pictures. The homes should also be reached by public health visitors who cannot only have "talks" with the women but give simple object lessons as well.

5. The amelioration of the present serious condition is an urgent necessity. Most of the maladies from which the students suffer are preventable and curable. A systematic examination of all students at the time of admission into a school or a college, and at regular intervals afterwards is necessary for early detection of diseases. Thus persons requiring medical aid can be taken in hand and their diseases carefully treated before it is too late. The economic value of the child's life is immense, and the money spent on medical supervision is many times repaid in the better health and happiness of the nation.

In short if we are to follow Western methods of education, if we are to live in the ever-increasing stress and strain so characteristic of modern civilization—and we have to remember that our choice is made and there is no withdrawing now—we must also adopt Western methods of safeguarding health. In most civilised countries all children are counted as national assets and they are taken in hand from the time of their birth, if not even earlier during the pre-natal period. During their infancy arrangements to provide for necessitous mothers are made and when they arrive at school, individual attention is paid to them. Not only are all children periodically inspected and their weight, chest measurement, eye-sight, etc., recorded but the weak and diseased are properly treated. It is incumbent on all parents and guardians, at the risk of legal penalties, to look after the cleanliness of their wards, and children are also legally protected against cruelty and neglect. The public authorities are responsible for looking after the general health and feeding of children, and some of them even provide meals to the poorest at public expense. Separate schools for the training of defective children are provided. In short the state assumes the role of the guardian over the heads of the parents.

But though this country is not yet ready for compulsion in such matters, a beginning ought to be made immediately. The local bodies should be enjoined to make special provision, and arrangements for proper medical supervision should be a preliminary condition in recognising and giving aid to schools.

In the Punjab the schools are either day or boarding schools. In the case of the day schools the responsibilities are divided between the teachers and the parents, while in the case of boarding schools the chief burden falls on the school authorities, but it is the duty of the parents to see that the children are duly looked after, when away from their hearth and home. They have a right to demand that proper attention be given to the physical development so necessary to preserve the due balance between the body and the mind, and it is not unreasonable if they should expect teachers to have sufficient knowledge of natural laws and hygiene. Unfortunately, it is a fact that much of ill-health, weak sight and chest weakness are the result of want of due care during student life. Thus it was shown by Dr. Cohn that while only 1 per cent. of village school boys suffered from weak sight the proportion rose to 25 per cent. in advanced schools.

Let us turn our attention to the most important factor of school hygiene and one to which sufficient attention has not been paid, *i.e.*, the diet and nutrition of school children. There are few who would dispute the importance of diet on health. Even the ignorant villager has sense enough to understand that the different tissues of the body are made and the daily wear and tear repaired from the food we eat. That brain work causes destruction of the highly specialized cells of the body is well recognised and that to replace one cell of the brain means more work than replacing one cell of the muscle or fat few would dispute, and yet while a *pahlwan* preparing for a wrestling match is given nutritious food, little care is taken of the diet of a student preparing for his examination. Observation of the health of school children for the last few years led us to the conclusion that many suffer from the effects of partial starvation. It was found that out of 14,000 school children in Bombay city 4,900 or fully 35 per cent. were under-fed and were below their size and weight. At Huddersfield in England, on the other hand, in 4,215 children the rate was well nourished 97·3 p. c., nourished 1·9 p. c. and badly nourished 0·8 p. c. only. The condition however in the Punjab does not appear to be very encouraging, as is shown not only from the high rate of morbidity among children (to which I have already referred above) but is conclusively proved by the height, weight and chest measurements of boys in one of the High Schools, in which 70 students were examined and all were underweight and narrow-chested as compared with the average of Indian lads of the same height. The conditions in other schools are not likely to be better, because this particular school is a mofussil school where the necessities

of life are comparatively cheap and life simple. The report of the Medical Inspectors of Schools appointed by the Government in 1917 further confirms this statement.

It is a sufficiently serious situation to call for urgent attention. It seems that our children are underfed both quantitatively and qualitatively.

In 1918, Mr. H. G. Wyatt, the Inspector of Schools, Rawalpindi Division, submitted to me for opinion, a diet table prepared by the Head Masters' Association for use in the boarding houses attached to the schools. The table had obviously been prepared with care, and so it was stated with the consultation of two medical men. But analysis showed it to be badly deficient in both proteins and fats. After careful consideration and analysis of the whole table I believed the diet to be lacking in two important proximate principles. The Hindu dietary table worked out as 62 gm. of proteids, 63 of fats and 330 of carbohydrates per diem, instead of the 120 gm. of proteids, 110 of fats and 250 of carbohydrates which a healthy man requires. The Mohammedan dietary table was rather better and gave approximately 68 g. of proteids, 96.5 of the fats and 312 of carbohydrates per diem. If a dietary table prepared with such care could not supply sufficient nourishment to the children one should not be surprised if the children whose feeding has not been particularly considered are found to be half starved. Sir Pardey Lukis, the late Director-General of the Indian Medical Service, believed that the chronic starvation of Indians in proteins makes them easy victims to infection.

Times have changed and the very necessities of life have become exceedingly dear and for a man of ordinary means with a moderately large family, necessities such as milk, ghi, and butter, have become luxuries. In one of the high schools of this province out of 436 boys only 3 per cent. were such whose parents earned Rs. 150 or more a month, and from this an idea of the income of ordinary parents can be formed. The result is that milk and ghi, butter and *lassi*, or eggs and meat which should form an important part of the diet of a growing boy at school are but occasionally seen at their table in sufficient quantity. The result cannot but be a handicap in the race of life and struggle for existence.

But what should pain us most is that even the children of rich families who can well afford to dress them in costly silks and serges are badly fed either from ignorance or culpable neglect. Leaving aside the economic side of the problem, let us consider the hygienic and physiological needs of the children in relation to their diet.

To understand the respective importance of the various proximate principles of food, let us for a moment discuss the

question why we eat food. The food we eat goes to build the body as shown by the increase of weight in childhood and adolescence. It replaces waste and produces heat and energy. The protein of food goes to build the body and replaces waste. It is necessary for the existence of all living matter. The fat and carbohydrate constituents of food are utilised in producing heat and energy, the use corresponding to that of fuel in a locomotive engine.

All the common articles of food contain the three chief proximate principles, proteins, fats, and carbohydrates but in various proportions. Thus while meat, eggs, *lassi*, cheese and nuts are very rich in proteins, they are deficient in carbohydrates. Ghee, butter and vegetable oils are pure fats. Milk contains all these three in the proportion in which they are required by the growing infant.

For a proper dietary, what is required is a mixture of various food articles with an eye to their composition. Whims or routine will not do. Children being growing animals need a comparatively large amount of proteins and fats, and that too in an easily digestible form. Hence eggs and milk should form regular articles of their diet, while sweets producing dyspepsia should not be given to them. The sweetmeat seller should find no place in the school compound as he is an ever present temptation to the children. Instead of sweets, such things as milk, bread, curd, *lassi* and eggs should be easily available.

The second chief defect in the school dietary is an excessive interval between meals 6 A.M. to 1 P.M. in summer and 9 A.M. to 5 P.M. in winter is too wide a gap, forcing children to eat too much in the morning, while during the day they are appeasing their hunger by frequent resort to the water pipe. You will remember that in old days, students used to take some well cooked bread with them to the school, but unfortunately this custom does not find favour with the 20th century boy. It is therefore necessary that proper arrangements should be made for providing light refreshments in the recess period.

The question of special grants for poor students may have to be considered but at any rate the present unsatisfactory condition must be remedied as has been done in England where education authorities have the power to provide meals for poor children. Although every family cannot afford to make satisfactory arrangement, yet Western methods must be studied and modified to suit our conditions.

An extract from the *Lancet* for February 11, 1922, p. 292, about the feeding of school children in Paris would show how the problem is being followed in other countries.

“ Obviously many children in Paris whose apparent circumstances would have led to no suspicion, have to be helped

in respect to their meals or they would be quite underfed....A midday meal is served in all the primary schools in Paris arrangements for payments being made where the children are not necessitous...The selection of children who should or should not pay is managed with delicacy ; every care is taken not to humiliate the child whose parents cannot pay by concealing from general knowledge whose dinner ticket is a gratuitous one. And in some districts the number of children who are helped is unprecedentedly large."

Attention should be paid to proper cooking as food badly cooked is not only so much money wasted but actually harmful to the system. The Medical Inspector, Ambala Division (1919) draws pointed attention to bad cooking carried on in most of the boarding houses, and I have similar experience of Lahore city. Dr. Mula Singh is deliberately of opinion that the food supply almost everywhere is below average and in some places only pulses are cooked and no vegetables. But the quality of food can be improved a good deal if the Superintendents take some interest, and the food can at least be cooked well which is rarely seen."

The system of giving contracts to sweet-sellers necessarily lowers the quality of the stuff sold. It is far better to have a shop of milk, bread, butter, etc. and to encourage students to take these in the recess period than a shop of sweets, *chola*, *alu* or some such stuff.

Next in importance to food is the subject of sleep and recreation but which unfortunately has not received adequate attention. I have a strong impression that a large number of students especially in lower classes suffer from effects of too little sleep. Dr. Lyster thinks that the effects of insufficient sleep upon the organism of the child are most disastrous both physically and mentally. And in his *School Hygiene for Teachers* he gives the amounts necessary for each age period. We may have to recast our ideas about a sluggard when we are reminded by Dr. Lyster that a boy of 13 should sleep 10 hours a day. In their *Hygiene and Public Health*, Parkes and Kenwood are of opinion that "Sleep is necessary for growth and repair of both physical and mental tissues, and deficient sleep is a great factor in mental dulness and malnutrition." They recommend 9-10 hours for 12—14 years. I quote these medical authorities because I have come across influential educational authorities recommending 7—8 hours sleep for school children and we are bound to protest strongly against this.

It is impossible for me in the short time at my disposal to discuss the question of school management, home tasks, age of admission, early marriage and the various other problems influencing the health of students. But before concluding let me for a moment pause at the subject of punishments

because it is a subject little understood by the average teacher or parent. They are not convinced of the evil consequences of making a person do a thing against his will, and cite cases of cure by doses of corporal punishment, and plead, 'It is experience, sure, solid and unquestionable.' It is therefore necessary for the teacher to study the latest researches in child physiology and "be convinced that the crushing of a child's will by the superiority of physical force, makes him either stupid and cowardly or false and hypocritical."

You cannot destroy or repress a natural force. Natural energy curved in one direction must seek an outlet in some other hidden and undesirable channel, unless it is intelligently transmuted into a higher form of energy with the free and willing co-operation of the person.

As physiological knowledge grows it will be recognised that coercion (compelling another to do that which he has not seen to be right for himself), whether it be by father, teacher or state will come to be condemned as intellectually and spiritually degrading, and in the long run devitalising the organism on which it is practised. We learn through experience and self-expression however slowly and tardily it may be for others. Elders may watch, brood over, guide, suggest, arouse but the lesson is to be learnt and the temptation to be got over by the fumbling child himself.

"Education means expansion, not pressure, it means leading or drawing out and not pushing in." It is a natural and physiological process and should have no harmful effect on health. It is therefore necessary that every school custom, the time table, the lesson should be examined and tested at first hand in relation to health. Observation, sympathy and common sense are the most needed qualities accompanied by an intellectual, freedom to withstand tradition and prejudice. In this the medical man is an indispensable factor, not merely to cure but to prevent disease, and the doctor and the teacher must work in closest co-operation.

THRIFT.

BY S. BEANT SINGH,

Assistant Registrar of Co-operative Societies.

Before an audience like this I need not explain the great importance of money, the vast power it wields, its manifold uses to the individual and the services it performs for communities in every part of the civilised world. Where is the friend that will do for you what money will? Who is there among us that does not know the part played by money in domestic happiness, social well-being, the intellectual moral and physical development of the individual? It has sometimes been called a second creator; it is, to say the least, a great force, a strength that supports and moves much in the world. No progress is possible without capital.

To spread the light of knowledge in a country, we want schools, colleges, universities, libraries, laboratories and many other things, and all this needs capital to start and sustain. There can be no development of industries without money, no railways, no canals and no other works of public utility without capital to make and run them. For every boy that attends school, heavy investments require to be made in books, benches and buildings. It requires lacs of rupees to construct a few miles of railway, every acre that receives water from a canal presupposes the investment of money in the major and minor works of irrigation. Consider industries; thousands of rupees worth of machinery are needed to employ and give work to a single worker. Dhariwal puts its investment at Rs. 6,000 per worker. Take trade; imagine what an enormous amount of capital must have been sunk in building up the present navigation system of the mother country; it requires lacs to fit out even a small mariner's boat before it is ready for the sea. Capital thus precedes all constructive efforts in the world and is a necessary antecedent to all attempts at the material advancement of a country. To make men and to make nations we need capital at every step, we need it to "make the mare go," in fact we need it to make this very conference go.

Now what is this capital but the sum total of the savings of an individual or a nation? There can be no capital without thrift or savings, we must have more earning and less spending in order to lay something by and to achieve this our income must exceed our expenditure. Thrift has two constant factors and the equation of thrift stands as follows:—

$$\text{Income} - \text{expenditure} = \text{savings}.$$

To get a positive resultant, the first item on the left hand side of the equation must exceed the second. If income equals expenditure and if it is not possible to increase the income or reduce the expenditure there is no scope for thrift. Thrift again is in a bad way if expenditure rises without a corresponding increase in the income. Thus it is that the process of thrift resolves itself into the processes of increasing incomes and reducing expenditures, placing the saving profitably, guarding it carefully and augmenting it continually. The art of thrift thus consists in nothing more than in adjusting the two items in the equation of thrift so as to leave a positive balance in favour of income.

Now income can be increased by improved methods of production, better marketing and new industries. If it is possible to raise ten ears of corn in place of nine at the same cost there is clearly an opportunity for saving; if it is possible to grow cotton that will spin into a finer thread and fetch Rs. 15 in place of one fetching Rs. 12 or Rs. 13 a maund grown at the same cost, there is certainly another opportunity for saving. If by improved cultivation we can add but one extra grain to each ear of corn we add a hundred thousand tons to our annual output. If better manuring can grow one extra blade to each plant we can certainly add abundantly to our stocks of fodder, and if with the help of

improved appliances we can double the output of a weaver at the loom we will set free the skill and intelligence of a very large number of men to do some other useful work. Similarly by means of an organised system of sale if we can spare to other productive works only half the number of our present middlemen and thereby add 6 pies to the rupee of our sale prices our gain will aggregate several lacs a year. All this it is possible to do ; than I have had the courage to anticipate and set forth. I do not mean here to enter into a discussion of the improved methods of production and marketing adopted in some other countries, but earnings as the result of improved methods of production have an important bearing on thrift and call for a passing reference. The second factor of savings, and, according to some, the greater and more important factor, is less spending. Less spending, not by eating less or dressing poorly but less spending by checking waste and unnecessary expenditure, by discouraging litigation, preventing mortality among cattle, taking precautions against sickness, reducing the rate of interest, purchasing requirements wholesale and consolidating agricultural holdings. I do not propose here to go into details as to the amount and extent of waste incurred through litigations and these other evils. I will only mention by way of illustration that the Punjabi farmer loses ten crores of rupees annually on his sugarcane crop alone through the use of imperfect crushing machines, and this is more than the Province pays to Government in land revenue. This figure has been calculated by Mr. Noel Deer who was recently invited by the Punjab Government to examine the question of the sugar industry in the Province. It is not the purpose of this paper to suggest and discuss remedies to check litigation and the allied causes of waste, all that I want to bring out is that each of them in itself constitutes a serious bar in the way of saving, and therefore it is practical patriotism to do all in human power to reduce by every means the evils of litigation, fragmentation of holdings, a high rate of interest, disease, cattle mortality and the illiteracy of the country. Every household in the village, every village in the country side is groaning under the burden of litigation and similar troubles and sources of waste such as I have enumerated constitute a constant drain on the people's income leaving them little surplus to lay by or to employ in progressive works. The Co-operative Department try to relieve them by setting up different forms of societies and have encouraging results to show in some of these lines. I only wish our politicians could discover the real malady which lies before them and give the country a lead. But this can only be done by going to people's doors and learning things locally ; no amount of platform eloquence will diminish the misery in the country, it will not remove unemployment nor will it provide work for those in search of it. To do all this we want industries ; no development of industries is possible without capital and capital without thrift is idle talk. Let thrift therefore be the first concern of all those interested

in the well-being of their country, their community, their own personal and domestic happiness.

Having done with earning and spending as the factors of thrift I now proceed to examine briefly the conditions necessary for its development and the causes that have led in the past, to a lack of thrift in the country. Thrift depends upon foresight, education, and settled conditions, and account for the want of capital for a long time in the Punjab, and account for the want of capital and of constructive work in the country. Frequent foreign invasions, constant internal quarrels and mutual feuds suppressed the people's sense of thrift. Nobody cared to save, when he knew that a Mahmud Ghaznavi was waiting close by to carry away every year the fruits of his labour. An Abdali or a Taimur though living hundreds of miles away was a standing source of awe to the Punjab producer who worked only half-heartedly and buried what little he saved. Property was hardly more secure when the Sikhs came into power, and thus for centuries people could not think of saving and they held the runs for a long time. I think it is this stage, more than any other, in the history of the Indian people that led to the Indian habit of hoarding. No one would invest for profit's sake when the capital itself was threatened; whatever little they saved they would not part with. They buried or converted into ornaments all their savings to keep them within reach. It would be difficult to calculate the amount of cash hoarded in the country, but it has been estimated that allowing one rupee as the daily wages of an Indian goldsmith, the annual amount spent on manufacturing ornaments exceeds the capital invested in the construction of both the Bari Doab Canals which irrigate 30 lacs of acres a year and raise crops worth Rs. 20 crores annually.

Another circumstance which is believed to have led to the neglect of thrift in the country is the fact that the support of life here has been comparatively easy. Land was rich and fertile and gave two harvests in the year, enabling people to carry on from one season to another without much worry or anxiety. The severe cold of England is said to be the parent of frugality in that country. Thus the northern nations of Europe owe a portion of their prosperity to the rigour of their climate. The idea of cold makes them save during summer to provide food, coal, and clothing during winter. The absence of a second crop compels the people to accumulate grass and grain for the winter season, and makes them careful about "little things."

I have tried to explain the meaning of thrift, its relation to national wealth, and its bearing on the individual and collective prosperity of a country. An attempt has also been made to describe briefly the several essentials of thrift and the conditions necessary for its development. I will now consider the practical side of thrift, how it is best served, what are the institutions designed to encourage this and to what extent they have succeeded in their object.

I have said already that earning is an important factor in saving, but that no saving is possible without earning ; it remains to explain that earning in itself does not constitute saving nor does it always end in thrift : it is nothing more than an opportunity for the exercise of thrift, an opportunity which is frequently neglected by the average man for want of long vision and foresight. In many cases more earnings mean more idleness, more drunkenness more broken heads and limbs. To turn earnings to good account therefore we need prudence and intelligent effort, since saving is an unpleasant duty, especially in the beginning, and is also difficult. It is an art—a difficult art, which comes only through exercise of forethought and self-denial ; like every other art it takes time to learn, and stands in need of guidance. It is uphill work, a “ move in the line of greatest resistance”. Prudence is a rare quality, the needs of to-day seem more pressing than the needs of to-morrow, and unless a fair degree of forethought acquired or inherent is present, it is not every man who will find it easy to forego the comforts of the present for the needs of the future. Money, they say, is more easily earned than saved ; therefore if it requires effort to earn money it requires more effort to save it. It is not everybody who can see the germs of pounds in the pennies and very few will believe that two pice saved daily from a luxury such as smoking and invested regularly at $6\frac{1}{2}$ per cent. will amount to Rs. 1,120 in 30 years. This sum is a small fortune in itself and is within the reach of every young man. It should not be possible to achieve this, yet few will think of aiming at it. My study of the economic condition of certain villages disclosed that the people there were spending annually more on smoking than the total land revenue paid to the Government. It was worked out that if it were possible to check smoking for 30 years and spend the money on work of public utility, we could give the village a small dispensary, a good veterinary hospital, a school of the middle standard and something more to pave the village streets and improve the village sanitation. If again the period of abstinence were extended over another 20 years we could get money to sink wells and irrigate the whole village land and also create an endowment fund to pay the village land revenue. Is not all this wonderful ? 50 years is no long period in the life of a village, and yet beginning from “ next to nothing,” at the end of this period the inhabitants would possess all the amenities of life—doctors to attend the sick, masters to teach the children, wells to irrigate the land, funds to pay the different cesses—and if they could but start an arbitration society to settle their disputes at home (which costs no money) it will be a bit of paradise, a tiny colony of true Swarajists, where there will be little sickness, little ignorance, little unemployment, no quarrels and much independence. Is there anything more charming in our beloved Swaraj ? And we get all this at what price ? At the price of stopping smoking and utilizing the savings in the right direction for a period of 50 years ? a thing by no means easy but not impossible of achievement, given sound advice and right persuasion.

Systematic efforts under wise leadership is the thing we want.

Take another instance. Six annas saved daily for 17 years from the birth of a son and invested at 7 per cent. compound interest will fetch Rs. 30 per mensem to educate the boy at college and give him five thousand rupees for a start in life after he has finished his studies. We complain of the costliness of higher education in colleges; that may be true, but a scheme like this is within the reach of many a man of limited means. A provident investment of Rs. 5 per month continued for 12 years from the birth of a daughter will give a man Rs. 1,100 for her marriage. Anybody making a monthly payment of one rupee for thirty years will then get Rs. 1,020 in a lump sum, which invested at 7 per cent. means an income of Rs. 6 per mensem. The first rupee saved is a step forward on the road; to save one hundred is within the reach of many; invested for a long period, they have astonishing results to show. Invest Rs. 100 for one hundred years at 7 per cent. and guess the results. Let some of mathematics help us in the calculation to work it out; it comes to Rs. 83,261. My only fear is that many of us may not live for one hundred years to see the sum, but we may have sons and grandsons, widows in the family, or other dependents, and have they no claim on us? And when parting will there be no satisfaction for the dying man in feeling that a duty has been done and an obligation discharged?

These fascinating results may perhaps stir some of you to take the first step on the road of thrift, and I consider it necessary to explain here briefly some of the dangers and difficulties in the path. The difficulties of thrift are twofold—mental and physical; mental difficulties are the strongest in the beginning but grow weaker as we go on. The first is, that many beginners feel themselves in a position of helplessness, a kind of timidity attacks them, they consider themselves unable to save anything at all, there is no margin, the position is too tight. To such persons I need only say that there is a thin end of the wedge, get it in first and the larger end will follow. Saving is within the means of every man who works, even if he be on the lowest rung of the ladder; what is needed is faith and determination. A careful scrutiny of the household expenses invariably discovers some soft place to drive the nail in, it may be possible to squeeze something out of the kitchen without affecting the quality or quantity of the food. There is always room for economy in dress without decreasing decency—in the turban, in the shoes, in the fashion of the shirt or even in the buttons of the coat—there is always something to save and cut out without impairing the efficiency of the article. The tailor's bill will always spare something if a plain Kurta replaces a turn-cuff shirt, they both serve the same purpose and last equally long. Then again the house wife may save something by doing part of the washing herself, it will give her exercise and bring in money. A member of my thrift society in Gurdaspur, a poor village school master tells me that he

is saving 2 annas a month on his kerosene oil and as much again on fuel. Some of his colleagues may find it possible to do the same. Some say "*it may be both true and possible but it does not mean much and is not worth the effort.*" Now this is the rock on which many beginners in thrift have stumbled, this is the first pit on the road of thrift, the first mental difficulty in the practice of saving ; let all those who begin, therefore, remember that the big thing about a saving is not its size but the fact that it is being done. Many a penny makes a pound, a penny saved is the seed of a pound saved, do not think how small the amount is, but how big it is going to be, count your chickens before they are hatched, become enthused over what your deposit will amount to in 30 years. Waiting for a large sum to start with, is chasing the rainbow, think of beginning with a *large* sum and you will never begin, begin with little and it will grow big.

The second rock on the road of thrift lies at some distance and is as dangerous as the thrift. There is a strong temptation to use up the money before it has grown to anything material ; some people appear to grow uneasy over a credit balance and feel attracted to draw it and use it before it is worth much. The saving was for a rainy day, but a cloudy day devours the fruit of all the labour. The money intended for a marriage is seized and spent on a betrothal. When face to face with such temptation the student of thrift must recall to himself the vast reproductive power of money, he should reflect that in using up his savings on trifling objects he is wantonly taking the life of the goose that lays the golden egg. Before touching his reserve he must think *not once, not twice, but a hundred times, a thousand times*, and it is possible that the frenzy may pass off, as in most cases it is a spasm and nothing more. Let Franklin's rule of thrift guide him here :

'Get all you can, what you get hold,
It is that will turn your lead into gold.'

I wish to make one point clear at this stage ; by all that I have said I do not in the least mean to imply that for real urgent needs we should hesitate to draw out and use our reserves ; all I want to emphasise is that the urgency of the occasion should be carefully examined before it is decided to spend the reserve. To deny help in case of real need would be to deny the very value of money to condemn the very purpose of saving ; it would be encouraging parsimony and avarice, and hoarding money for money's sake. It is good thing to be able to get money, but it is a sorry thing to let money *get you* ; a miser is as dangerous to society as a spendthrift, the one will give nothing and the other will have nothing to give.

The third danger which meets a man in the path of thrift is the desire to invest one's savings in a way that will swell them quickest. To such persons I would repeat the caution that "*hurry makes curry,*" and pitfalls must be avoided.

The mental difficulties in the exercise of thrift having been discussed, I proceed to explain briefly the other set of difficulties,

described as "physical obstacles." A resolution to save has been formed, curtailment in expenses has been effected, the beginner has six pies in hand or has saved six annas to lay the foundation of an education fund for his son. Where should he keep the money? It is not safe at home and it will not grow there as expected. There is no bank at hand, and it is not every bank that will receive your saving of six pies or six annas readily because it does not pay them to do so. But we have post office savings bank, insurance companies, relief societies and mutual benefit funds. They are all useful in their own ways because they encourage the habit of thrift in the country, but their one common defect is that they are not within the reach of the average man, their number at the present time is limited, and by the very nature of their constitution it will not be possible to start many of them in the country for a long time to come. The Post Office Savings Bank, for instance, is an institution of branches and its development is bound up with the expansion of the Post Office system in the country. I think it will be long before we can hope to see a Post Office Savings Bank established in all important villages or in all convenient centres in the town; moreover, the savings bank is only a minor consideration in the opening of a post office in any place. Its main function is different and must take the first place. The scope of usefulness of a Post Office Savings Bank as an agency of thrift is further restricted by manifold limitations on the amount of deposits. The depositors have no control over the accumulation and they cannot alter the existing rules to suit local conditions. These post office institutions are passive receptacles of deposits, where deposits may be put in at pleasure and withdrawn at will. It is no function of the Post Office Savings Bank to insist on regular systematic savings from their customers. The money when drawn may be spent in any way, the post office is not concerned as to where it goes. It helps those who come to it and is useful for a class that has already realised the importance of thrift and of prudent habits. It affords an opportunity to the trained and intelligent but does not undertake to teach the value of thrift to those who are ignorant of it. Their people are acting on their own initiative and there is very little of the discipline of society and the example of one's fellow beings; active persuasion to save and to continue saving is not to be found in the Post Office Savings Bank.

The Insurance Companies again have their own defects of constitution so that it is not possible to create them in very large numbers. The minimum number of co-workers required to make success of an insurance company is very large, and we cannot hope to secure it everywhere. These companies admit only the strong and healthy and exclude all who are weak and old, thus refusing the benefits of thrift to those who start late or need it most. The system is rigid, there are difficulties in the alteration of premium rates, and it is not possible to raise moneys for more profitable investment or for use in time of real need except, perhaps on very disadvantageous terms. Its chief beauty

is the cover it provides against the principal risk of life, but it is never a profitable investment for a long life. I hope these remarks of mine will not offend any Director or Agent of an insurance company. I mean no offence, I have the highest respect for such persons as the apostles of thrift in the country. I only point out that the system though excellent in some respects does not fulfil all the requirements of an advocate of thrift. I have, therefore, ventured to offer comments in the hope that well-wishers of the country may think it worthwhile to work out a scheme that will suit our conditions and make thrift possible for all who feel tempted to try it. The Co-operative Department has drawn up a scheme which aims at removing the defects of the existing system. I claim no perfection, but I recommend all those present here to examine the model by-laws of a Co-operative Thrift and Savings Society, and to make suggestions for improvement. It is possible that in removing some of the old defects we may have introduced others unconsciously. It will take too long to describe the scheme and discuss it in all its details. All I can say is that we have tried it among teachers, clerks, traders, shopkeepers, among men and women, young and old, and they all find it suitable. Its chief virtue is that you can found such a society almost everywhere, in the towns and in the villages. All you want is a group of ten adults above the age of 18 who earn their living honestly and know each other well. There are no hard and fast limitations on the amount of savings you may like to put in, while reasonable facilities have been given for withdrawing deposits in case of really urgent needs, which however the Committee has a right to examine in order to prevent unnecessary encroachment on the steadily growing fund. To ensure a regular flow of savings from the members provision has been made for late fees and penalties. The management of money is under the control of the members themselves and no speculation is allowed. The system appears to be working quite well. We have now over 600 such societies in towns and villages with about 10,000 members, and contributions amounting to over three hundred thousand rupees which is a promising start among small men. I recommend you all again, gentlemen, to study our scheme and by-laws, explain them to others and help us with your suggestions in order to make it universally popular. We wish to take the gospel of thrift to the door of every man in the country and for this we must provide full facilities and need your constant help. I have said all I had to say but I feel an irresistible temptation to give a very brief account of some of the methods and devices that are being tried in other countries to encourage the habit of thrift among the people. You may be interested in those methods, and some of them might help in arousing fertile brains to action, to think out and devise plans for their own country.

The teacher plays a most important part in developing the virtue of thrift in advanced countries and I must acknowledge that his brother in this country has taken the lead and responded liberally to our call for help. In England, Italy, and France

the teacher has devised attractive methods to inculcate the habit of thrift among children. Savings boxes are distributed free in the schools, savings books and savings cards of different denominations are sold among the children, and the proceeds are entered in their accounts. With lessons in literacy they give lessons in thrift and the figures for each institution are most interesting. I must omit them for lack of time, but I only wish we could do something on similar lines in our Indian schools.

The saving institutions of Brazil have important lessons for our politicians and for those reformers who are interested in the uplift of our depressed classes. In that country such banks have been made agencies in the general extinction of slavery. Since 1871 each slave has been allowed certain hours a week to labour for his own benefit, and when his earning deposited in the savings bank amount to a given sum the remainder of the price of his emancipation is provided by the State out of the public funds. Children of slave mothers who since 1871 have been born free are encouraged to place their savings in the school savings banks. By a law passed in 1885 immediate enfranchisement at the cost of the State was conferred upon slaves employed on agricultural estates and the employers were made to pay up the amount by slow instalments. What a sweet compulsion? What a splendid record of service! Thousands of slaves have gained their independence in this way whom nothing but the hand of death could have set at liberty.

I fear, gentlemen, I have exhausted your patience and must now close. I hope you will not forget "Thrift" and will start the new year in the right way by joining a thrift society if one exists in your neighbourhood: if it does not exist already you will do a service to yourself, your neighbours and your country by creating one and becoming a member. Begin to-morrow, put saving into every activity, when earning think of saving, when spending think of saving, when you think of being worth something remember that no one is worth anything who does not spend less than he saves.

"Earn more save more

Spend less, save more."

"Save more, save more."

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EDUCATION OF ADULTS IN THE PUNJAB.

BY SARDAR JAWAND SINGH, B. A.,

District Inspector of Schools, Kangra.

The general spread of literacy among the parents is sure to lead to the universal spread of education among the children and it is mainly because of this that the Education Department has undertaken, for some time, to start adult schools.

Before 1922 there were very few night schools known in the province, except the evening continuation classes at the Y. M. C. A., Lahore, which classes are still doing very useful work. It is to the credit of Khan Bahadur Shaikh Nur Elahi, (then Inspector of Schools, Multan Division) that at the end of the year 1923, there were about one hundred night schools in the Multan Division with a little over two thousand adults on their roll. After March 1923 efforts were made in all Divisions and the movement became rather general.

History of the movement. It would be interesting to note that until 1923, the movement had hardly been given any official cognizance. The Khan Bahadur was carrying on the experiment in his own Division, entirely on his own initiative. No allowances were given to the teachers; the incidental small changes for light and other contingencies, were met from public subscription or the levying of small fees. These were really very hard times for the movement, for it was rather difficult to get this additional work from the teachers without any allowance. It was then considered advisable to consider these night schools as indigenous schools for grant purposes and award grants at two-thirds of rates prevailing for aided indigenous schools. This was something and there came into existence a large number of night schools.

About the middle of the year 1923, it was discovered that the term night school was a misnomer, for it was not always possible for the adults to meet at night. The name was changed to adult school.

After September 1923, the movement was officially given cognizance and a scale of allowances for adult schools was fixed. Since then the movement has been making steady and rapid progress in all Divisions.

C. M. No. 119-G. S., dated the 28th September, 1923, Proceedings of the Punjab Government (Ministry of Education), Education Department, is an exhaustive note dealing with all questions relating to adult schools.

At the close of the year 1925, there were altogether 2,373 schools for adults with an enrolment of 61,961. The expenditure on these from all sources amounted to Rs. 47,123. Of this as much as Rs. 36,234 was met from Government funds. This is, indeed, an indication that a movement which had a humble beginning, has assumed very great proportions, because of its utility.

There are quite a number of people (outside the Education Department) that have begun to doubt the utility of the measure. Their main objection is that most of these schools have a fictitious roll and that very little work is being done. There is some truth in this. For some time past the work of the inspecting staff has

been increasing and it was really difficult to have any effective check in this direction. But now that the inspecting staff has been strengthened, this objection should be removed, and all schools should have a genuine roll.

But such people are ignoring the great changes that the adult schools are gradually bringing about in the life of the rural people. A *bihishti* carrying his load of water and reading his book, a cow herd revising his lesson, an old man with white hair vehemently repeating his lesson—such and sundry other scenes are not uncommon in the village life of the Punjab. The rustic and rude manners of the villagers are fast changing. Instead of the doubtful songs that they used to sing, they take pleasure in singing hymns from their books. The adult school is vastly improving their habits and characters.

The teacher is a great factor in the adult school. He should have the necessary enthusiasm for the work and then he will face all the difficulties that come in his way. These difficulties will differ according to the local circumstances. The difficulty common to all places is meagre attendance in the beginning. For this there is no one remedy. In almost every village there is a place where people meet at a fixed hour every day. The teacher should make use of this meeting place of the villagers. He should carefully select his poems and stories and then recite them to the people. This will certainly excite their interest and most of them will express a keen desire to be able to read such poems and stories.

The instruction in these schools is confined to reading, writing and a little arithmetic. Any one vernacular of the province may be taught according to the local needs of the place, and the adults might meet at any time of the day for instruction. The teacher will find it very difficult to grade his pupils—they will make progress at different rates, for they vary in age and temperament. In adult schools the method employed is more of individual instruction and less of class instruction. The teacher should bear in mind that with adults his progress in instruction should be rapid and he should try to put them to actual reading in as little time as possible. The adults will not be contented with meagre instruction. Experience has also shown that generally speaking adults make more rapid progress than children. In some places, old people have been taught to read and write in six months. In some places it has been noted that some adults write a very good hand.

The libraries for adults started last year have increased the utility of the adult school and placed it on a more stable footing. After finishing their instruction in reading and writing, adults can make use of this library and thus by self-effort increase their store of knowledge. These libraries for adults are a really great

thing from the point of view of adults ; for the adult school creates in the adults an interest for reading suitable matter and in the absence of these libraries the adults will soon lose their interest and fall back into illiteracy while the library will always augment their store of knowledge.

For more than one reason, it is necessary that adults who can read and write any vernacular should be granted a certificate at the end of the course of instruction. This will determine the net out-turn every year as compared with the expenditure incurred. There will be many who will greatly appreciate the mere possession of this certificate.

So far these adult schools have been started at ordinary schools. There are some people who believe that the adult schools might well be started in jails. It is difficult to say to what extent it is expedient and what difficulties it might create for the administrators. But it is highly desirable that adult schools might be started with factories and farms where large numbers of people come together for work. It will certainly pay the owners in the long run, if they do what they can to improve their labourers. It will not be difficult to utilise the services of a neighbouring school teacher or some clerk of the factory. In such cases one hour a day might be set apart for instruction and this one hour might be increased to an hour and a half when the adults have made some progress. It is reasonable to expect that the net work these literate adults will do in the end, will more than make up for the last time. After an adult school has been in existence for some time a library might be started, which can be made use of by the adults, during their recess hours or after working hours.

The institution of adult school and the kindred other movements has greatly added to the work of the inspection staff. But tribute must be paid to the Head of the Department and the various inspectors of the Punjab, who have been so tactfully managing the whole thing and getting this additional work done, at a very low cost. The time and tenure of Sir George Anderson will leave a distinctive mark on the history of education of this province. Many new and useful things have been done in his time and one of them is the institution of the adult school for which the rural masses and the coming generations will always bless him.

FOOD AND GROWTH.

BY MISS M. SIMON,

Secretary, Lady Chelmsford League, Punjab, Lahore.

The problem of nutrition is older than the human race. It began when life began on this planet. The survival of a species of plants, and later, of animals, was conditional upon their finding proper food and a favourable environment.

Not only the physical development of man, but the fate of nations has been in the past in no small degree dependent upon their ability to solve the food question. In many revolutions the food question has been the potent factor in stirring peoples to overthrow their governments. Perhaps the subject of food and nutrition has come to the front to-day in a way in which it never has before—it is one of the most pressing world problems. We are actually witnessing countries such as Poland and Russia the consequences of the underfeeding of whole nations.

All unfavourable hygienic conditions—especially lack of food,—bear most heavily upon children, who have less resistance than adults and are more susceptible to infection by disease.

With growing children, the food allowance must not only supply energy and repair waste, but in addition must allow for growth. There are certain food constituents essential for growth and unless these are supplied, growth suffers, even though the quantity of the food is sufficient. You cannot have health in the child without proper nutrition.

Now, in infancy, success or failure in nutrition soon produces obvious results, and the subject has been fairly carefully studied, but the neglect of the child's nutrition after infancy does not bear such speedy consequences and, perhaps for this reason, does not receive nearly sufficient attention.

Though children may not die as a result of mal-nutrition, they become anaemic, stunted in growth, under weight, with feeble resistance to disease and altogether lacking in animal spirits which make work and play a joy to the healthy young human animal.

Now the blame for this neglect must be laid partly upon parents—generally due to ignorance of the simplest principles of nutrition, often to the weak indulgence of their children by many parents, which permits the formation of tastes and habits in the selection of their food, in the manner of eating and mode of life generally, which are incompatible with normal nutrition and growth. This is perhaps the most difficult cause to tackle—there are others such as economic conditions which will probably always exist as a basis for an irreducible minimum number of ill-nourished children.

Who is to teach the parents? Our leaders should be the doctors, one of whose most important functions ought to be that of a health teacher and only second to them come the teachers, who are, after all, building up the parents of the future and whose obvious duty it is to make health—including, of course, the study of food values—one of the most important branches of education.

The nutrition of the child is dependent on 3 factors, the character and quantity of his food, his general hygiene, his inheritance. The last mentioned we cannot influence but the first two are within our power to direct and control, and we do owe it to every boy and girl to give them the opportunity to reach the best physical development of which they are individually capable.

The effects of mal-nutrition on the school child have been fairly extensively studied in other countries and it would seem to have been conclusively proved that there is a close relation between physical development and mental progress in school. Some of the conclusions arrived at are well worth studying, though time does not admit of touching upon them now.

As regards diminished resistance to disease, owing to impaired nutrition, proof is afforded by the enormous increase of tuberculosis and, indeed, all infections of children in those parts of Europe where the load of war bore most heavily.

The impulse of all young things to grow is, however, a very strong one, and even though held in abeyance for considerable periods, if and when the conditions which have inhabited growth are removed, the loss can often be made good.

I will now enumerate (I am not a physician and can therefore only pass lightly over pathological processes)—the so-called deficiency diseases, diseases produced by failure in diet to supply some things which are essential to normal nutrition.

Scurvy, beri-beri, certain forms of eye disease, rickets and other bone diseases, all are closely associated with faulty diet, which leads me to pass on to enumerate very briefly some of the principles which should be grasped in planning model diets.

What is needed for growth? Variations in the rate of growth of children at varying ages must be taken into consideration in ascertaining their requirements, also their nature, whether active or otherwise, etc. These requirements are usually measured in calories—a calory being a unit of heat, the heat supplied in food which is needed to keep life going, and promote growth and metabolism. The number of calories which must be supplied in the food given, are 3,330 per day for girls at the age of 14, and 4,100 for boys at the age of 16, after which ages the values drop, till we find an adult man with an average caloric requirement of 3,360 and 2,640 for an average adult woman.

The caloric requirements of individuals and caloric values of common foods are worth studying, though I do not propose to labour the point now. The most important chemical constituents of food are—proteins, fats, carbohydrates, mineral salts and vitamins.

Let me introduce each to you in turn, briefly.

1. Protein foods supply the nitrogen which is necessary for the constant renewal of the cells of the body and for promoting growth. They are highly complex substances, and differ in quality, those of animal foods being, as one would expect, more similar to those of the human body and therefore probably of more value than vegetable proteins to the growing child. The proteins most suited to the needs of children are those contained in milk, eggs and fresh meat. If we are to rely only on vegetable proteins (contained in peas, beans, lentils, etc.) a larger proportion of them must be given in order that the growth requirement may be supplied. The difficulty arises from the fact that vegetable proteins are combined with a considerable amount of carbohydrate, and in order to obtain sufficient protein, an excess of carbohydrate must perforce be taken, which often over-taxes the digestive powers of the child, besides supplying carbohydrate greatly in excess of his physiological requirements.

2. Fats supply energy and to some extent also do the same work as protein, but probably their chief use during growth is that they contain that most vital element, vitamins, about which I shall speak presently.

Fats are contained in milk, egg-yolk and certain organs such as liver and kidney, and above all, in cod liver oil. Their absence from the child's diet generally means the increased susceptibility of the child to disease, and to deficient bone formation.

3. Carbohydrate—sugars and starches—beyond supplying the necessary number of calories (units of heat needed to promote metabolism) play no very special part in the child's growth, they serve as a source of energy and play an important part in the metabolism of fats. They are the cheapest of the food stuffs. Such are rice, sago, potatoes, sugar, *ata*, *maida*, etc., and there is of course a good deal of starch even in the vegetable protein foods such as peas, beans, lentils.

4. With mineral salts we need not concern ourselves greatly though they are of great importance, specially those of iron, calcium and phosphorus. Iron enriches the blood, and milk is deficient in iron salts though rich in calcium and it is largely because Indian mothers keep their babies so long on milk, instead of supplying other foods when the baby has one or two teeth—food with a higher percentage of mineral salts, especially iron—that so many children of 2 years old are anaemic and therefore highly susceptible to disease. This habit has other

disadvantages too, but as we are considering mainly the requirements of older children we cannot enter into these.

A diet in which milk, green vegetables and eggs are included will contain sufficient mineral salts for the growing child.

Proportion in diet is of the greatest importance. We should study the caloric values of our common food stuffs and plan out a diet for the child in which the following proportions are ensured, i. e., that 15% of the total calories are supplied by protein, 35% by fats, and the remaining 50% by carbohydrates.

5. We must now consider vitamins, on which the chief interest of dietists centres, now-a-days, although all acknowledge that of these "accessory food factors" much remains to be discovered. Scientists experimenting on animals with model dietaries found that the most ideal combinations of food when scientifically, but artificially prepared, failed to secure good results, and they were finally forced to the conclusion that something was lacking which eluded the microscope or analysis, but which was present when the foods were supplied in their natural raw form. Because essential to life—*vita*—these unknown substances were named 'vitamins' and observers now agree that there are certainly three, probably more; they have been named Vitamine A, (the anti-rachitic factor associated chiefly with animal fats, and some with green vegetables but none with vegetable oils. Vitamine B. (the anti-neuritis factor, very widely distributed in yeast, eggs, meat, in all seeds and grains, potatoes, and most vegetables, though absent in white wheat flour and polished rice). Vitamine C. (the anti-scorbutic factor very much more delicate than the above two, destroyed by cooking, found in fruits and vegetables, especially oranges, lemon, grapefruit, cabbage, tomato and yellow turnip, and a small amount in meat, milk, and green vegetables).

It is an interesting point to note that the milk of animals kept in confinement (such as stall-fed cows, and women living under un-hygienic conditions) deprived of ample fresh air and sunlight and food rich in vitamins seems to lack anti-scorbutic properties, and their young have been found to suffer from the deficiency disease known as scurvy.

The knowledge of vitamins is, however, at present quite incomplete, but it has greatly helped to put the whole subject of nutrition on a scientific basis. For practical purposes, we may conclude that if a growing child's food be varied, and include milk, green vegetables—especially raw or cooked cabbage, and cereals from whole grains, potatoes and fruit, we may be reasonably sure of their getting the right amount of these all important vitamins.

Now it is going to be no easy task to improve the nutrition of the children of India, but publicity, and above all,

education of the young in this respect, will in time bear fruit. Faulty hygiene must always be associated with mal-nutrition—eating between meals, lack of fresh air in school rooms, overcrowding of dormitories, lack of opportunity for outdoor play, late hours, over activity in work or play, (whereby so much of the energy value of food is consumed that none remain for growth), all these re-act unfavourably on the child, as much as actually does deficient food.

It seems doubtful whether the problem of health, nutrition and physical development is going to be solved along the present lines of physical education as given in schools, unless it includes the formation of the health habits. Lectures and Health talks will accomplish very little, the aim of the teaching must be to get the children to do things, and in all health teaching to use methods which appeal to the child's imagination and make these Health habits as much a game as possible, especially up to the age of 10 or 12. May I give a few illustrations of how this can be done. A dramatic figure such as a Health Clown or Fairy, who in the course of half an hour's fun can include in his pattern a recital of some of the laws of health or invent games in which the children must keep the rules, and "lead a hand and play the game," accomplishes what no theoretical teaching can ever do and the children remember. When a little older, children love organisation, and to form Health Clubs, in which records are kept of the daily performance of health habits and daily inspections made by the officers, badges, etc., awarded is a valuable help.

The dramatic instinct is strong in children, and health plays are of great value I think. Foods can easily be personified for a change, as a relief from the fly, the rat and the mosquito. Of course, teachers with enthusiasm and imagination are needed for the success of any such scheme.

Competitions in health poster drawing often stimulate the children's imaginations and much originality results, or prizes given for the best rhymes dealing with foods or any health habit. It has been proved that children take a tremendous interest in their height and weight development. This must be carried out regularly and fairly frequently (at least once a month) and the records of each child charted, and in a conspicuous place on the same chart the average weight and height of boys or girls of the average age of the class. Each child can see what his or her relative position is, and no child likes to be below standard and will often eagerly carry out rules of health or give up bad habits of eating, etc., rather than lose his place among the "up to" standard children. Children do not by these methods become self-conscious regarding their health—nothing is suggested as to disease. Health as a thing to be gained, to be kept and to be enjoyed by means of our own good habits, is the thing kept

before their minds and the laws of health can so easily be understood that no exacting technical knowledge is needed by the teachers, only enthusiasm for the cause. Health stories should be more widely written and read, and lives of such men as Pasteur studied as well as Napoleon. Why should not older children have public health instruction co-related to other subjects in the school curriculum; as, for example, the failure of the French to build the Panama Canal, Malaria and its subsequent conquest? Why not let children solve mathematical problems such as the following: "Calculate the cost of erecting and maintaining a water filtration system for a city and compare this with an annual occurrence of one hundred cases of typhoid fever each year, with an average disability of 8 weeks for each case, without taking account of loss of life."

Time does not permit me to describe the Nutrition classes as held in America, but I believe their results have been surprisingly good and far from the children being excluded from school on account of their poor state of health—they have rapidly caught up with those with a better start and "graduated" from the class taking an imposing stamped certificate of fitness with them.

In conclusion I would quote Dr. Osler's words when addressing a public health meeting. He said, "We have a disease more widely prevalent than tuberculosis, more fatal than cancer one that causes more deaths every year than the epidemic diseases—the disease is named Apathy." That disease I maintain is preventible and to quote once more the late King-Emperor "if preventible in Heaven's name why not prevent it."

It all comes back to the education of the individuals in matters of personal hygiene, and education is in your hands and may most profitably be given in the schools.

Let your aim be to make the teaching of Health interesting and its practice attractive.

SEPTIC TANK ARRANGEMENTS.

BY P. CARTER SPEERS, ESQ., B.Sc.

The subject matter of my paper is to say the least very odoriferous. I am not quite certain whether it is a compliment or otherwise to be asked to speak on such a subject. I was told some time ago that certain of my students said that I had come to India as a Professor of Chemistry and might therefore be considered to have a fairly high caste. Before long, however, becoming interested in Industrial Chemistry, I became a "Chumar" since I started the tanning of leather. But that fall in the scale was not sufficient, for soon it was conceived that I

had fallen again, for I installed flush system latrines and septic tanks in the college to replace the old type ; and hence I had undoubtedly become a 'maiter.' What the next step down is I am not quite sure, but if it can have as beneficial results as the previous ones I will certainly welcome it.

I have no doubt that there are many in this conference much better fitted to talk on this subject than I, for I do not pretend to be a bacteriologist and yet it is mainly on bacterial action that septic tanks depend to accomplish their work. I imagine the only reason I was asked to speak was my experience in installing the septic tank system in my own house and in the large installation in the Forman College.

The problem which the septic tank seeks to solve in places where proper sewage systems do not exist is in my opinion as a layman, second only to malaria as the outstanding problem connected with the health of India as a whole.

It is a recognised law of animal life that no animal including man can habitually receive back into its own body any of the discharges or excretions which have passed out from its bowels, kidneys or respiratory organs or from others of the same species even where such excretions are healthy, without constant lowering of vitality and lessened resistance to disease. When we remember in addition that it is in these same discharges that the germs of many of the worst diseases such as cholera, dysentery, typhoid fever, to name only a few, find their way from those who are sick, to the outside world to bring down other victims, the prime importance of any method which can safely and thoroughly remove this menace, as the septic tank system does, appeals most strongly. The sanitary or rather insanitary condition under which the bulk of the people of India live to-day lays them open to the constant admission to their systems of the disease laden discharges and excretions from themselves and others either directly through contaminated water and soil in which food stuffs are grown—or indirectly through the transfer of these substances and germs from discharges to food stuffs or directly to the person through the medium of other insects.

If the constant readmission of such things to the systems of the people of India could be stopped, such diseases as cholera, etc., could become of but historic interest in India as they have been in so many places in the west. The most obvious way to accomplish this is to stop it at its source and see to it that these discharges are destroyed or rendered harmless before they can do their damaging work in pulling down mankind.

The present type of latrine so commonly seen in schools and other places is most offensive. In theory it is a long step in advance of no method of removal at all but in practice it usually fails,

for as ordinarily it seems nearly impossible to keep such a place free of flies and other insects and animals, and the moment such can get access to a latrine it is really worse than no place at all, for everything being present in a concentrated form the hordes of flies, etc., can most easily collect and pass on disease germs to others. Further this system merely collects the material and provides no proper way of disposal at all. Usually the disposal methods in connection with the type of latrines render things worse than ever—those of you who have had to pass a slopping dripping conservancy cart as it passes along the road can testify to this, I am sure—and in the country the methods employed are often much worse. It might be well in passing to remark that offensive smells in connection with any system are not necessarily dangerous. Often in fact they are the reverse, for they indicate that bacterial action may be going on accompanied by the destruction of most of the disease germs. On the other hand there are smells and smells.

The septic tank system is one which has been designed to remove the ever present menace from these discharges by destroying them before they have the chance of destroying us. It is merely a system which allows the matter to destroy itself through bacterial action, for of course there are good bacteria as well as bad.

The system owes its start to the fact that it was noticed that the sludge in sewage sedimentation tanks which were allowed to go uncleaned too long started to putrefy of its own accord and give off gas. On studying this procedure it was realized that bacterial action was going on, which, if properly controlled, would in time completely destroy the sewage, giving rise in the end to various gases, some bad smelling like H_2S and some explosive like hydrogen and methane—but all harmless so far as disease goes—and various nitrites and nitrates and phosphates in a stable form available as excellent plant food and again harmless from the disease standpoint, all of the harmful disease germs being destroyed by the “good bacteria.” This bacterial action will usually start of itself if given a proper chance, but can be developed or started if necessary by the addition of suitable bacteria—containing matter; horse manure well rotted is about the easiest and best material for this purpose. Provided the conditions are suitable the development of huge quantities of the “good bacteria” takes place very rapidly and in developing they feed on the bad and destroy them, and also bring about many chemical changes in the organic matter present, leading to the eventual change into harmless, indeed helpful, forms of matter.

This process may be divided into three main parts which are not however absolutely separate for they may to a certain extent all be going on at once. In the first part, due to the presence

of a certain amount of oxygen, urea, ammonia, and other products of digestive or putrefactive decomposition are partially oxidized. Soon however the available oxygen is used up and the second part of the action starts in under anaerobic conditions; during this part, by the action of bacteria, most of the disease germs are destroyed, the proteins are broken down to form urea, ammonia, and foul smelling mercaptans, hydrogen sulphide, etc., carbohydrates are broken down only much more slowly into CO_2 , CO, Methane, etc., and cellulose also is broken down only still more slowly. Even oils and fats are slowly decomposed, though very slowly. After this comes the third part in which all of these decomposition products are oxidized under aerobic conditions by suitable bacteria into the useful nitrates and nitrites, etc.

The first two parts of this process take place in the septic tank, the third either in the ground or through other means of disposal if the quantity is large. The septic tank and its absorption system supply the necessary conditions under which these actions can take place of themselves. There is no complicated machinery needed, nor chemicals to be added requiring skilled attention; in fact once a system is working the less that is done to it the better, the only attention that it needs being to keep harmful things such as disinfectants which would stop the bacterial action out of it, and see that a sufficient water supply gets into it to keep the process moving forward at a suitable rate. Once in a long time it will be necessary to clean the tank out and start it afresh owing to the accumulation of inorganic matter, and undecomposable organic matter. But this needs to take place in a well-designed system only once in four or five years. More frequent cleaning is probably needed in India owing to the habits of many people in the use of earth and stones instead of paper.

It must be constantly held in mind that the action in these tanks is bacterial action and care must be taken to see to it that nothing is done that would destroy this action. If this is done the system will be practically odourless and automatic in its action.

The working of this system is not dependent on a supply of running water, for a very satisfactory working can be accomplished if two or three *balties* of water are thrown in daily. Of course if running water is available still better arrangements can be made with flush system seats, etc., but the action is the same in either case.

The construction of the septic tank is simple, consisting of a covered cement tank set in the ground. A convenient size suitable for use by up to fifty people, where bath water is not run in also, being four feet deep, four feet wide and six feet long, divided into three compartments of two feet each by two, or

three feet high baffle walls one impended from the cover and the other from the floor. In the case where running water is not available the seats may be placed directly above the end compartment, each seat provided with a hinged cover to be closed when not in use. When in use the material falls directly into the first compartment where, in falling, it becomes more or less broken up and solid matter may fall to the bottom where the bacterial action soon starts and liquefaction starts, the products of the action passing under the first baffle into the second compartment where the action is completed mostly. From this second compartment the clear liquid passes over the second baffle wall into the third compartment where the action continues on the liquid which eventually passes out through a drain pipe into the absorption system in which the third part of the action or nitrification takes place. This usually takes the form of a farm drain pipe line set some twelve to eighteen inches below the surface of the ground—with joints left loose so that the effluent from the tank can seep out into the ground where it meets with the nitrifying asorbic bacteria which complete the process of disposal. In the plant described the pipe line needs to be about 100 ft. long depending on the soil. Thus nothing appears on the surface at all—all matter is completely removed without danger to anyone and without trouble, other than to see to it, in the case of the system without running water, that four or five gallons of water are thrown through each seat with more or less force each day. If the places where the seats are screened and the seats themselves have hinged covers the chance of spread of disease through flies ceases to be any problem at all. Of course where flush system is used for the seats this danger is still more completely removed.

It is necessary of course to see to it that the position of the absorption system underground is such that unchanged liquid cannot find its way directly into the water supply such as wells, etc., but other than this it need cause no alarm. In the system I have in my own house, I have a most flourishing flower garden above the absorption pipes. As to sizes required, the dimensions I have quoted are sufficient for the use of some fifty people where there is no running water. If the tank is to be used for a house using the flush system, and bath water, etc., is also to run into it—the size necessary can easily be calculated from total amount of liquid to pass into it in an average day—the tank wants to be sufficiently large to hold the entire inflow from the house for from 24 to 48 hours—or it may be roughly calculated on the basis of about eight cubic feet tank capacity for each user. It is better to have it too large than too small.

One very great advantage of this system is that it may be so easily expanded with growing use—additional tanks added or the existing tanks being enlarged as needed. It is wiser not to increase the depth by very much though large installations have

been constructed up to ten feet deep for taking care of whole cities.

I will not bother you with actual details of construction, etc., they are simple and can be easily found in printed bulletins giving all details.

I would refer you to—

Bulletin of the State Board of Health of Kentucky, U.S.A. on the Kentucky Sanitary Privy—Jan. 1920, available from the office of the Board at 6th and Main Streets, Louisville Ky., U. S. A.

or "Sewage treatment from single houses and Small Communities" by L. C. Frank.

U. S. Public Health Service, Bulletin 101, 1920 ;

or "Sewerage and Sewage Treatment" by H. E. Babbitt published by John Wiley & Sons, N. Y. C.—1925.

or "Sewerage" by A. P. Folwell published by the same company in 1922.

I have not gone into the various modifications of the tank I have described—such as the Imhoff Tank, etc., nor into other methods of disposal of the effluent from the septic tank, for there are many, but for installations suitable for schools, etc., the type described above is most simple and easy to be installed. I would be very glad indeed to be of any help possible to any one wanting further information on this matter.

In conclusion may I add that I consider the big installation which we have at the Forman Christian College as one of the greatest developments we have ever made. I believe few things could have greater effect on the health of school children and the country as a whole, than the universal adoption of such a method. It is being used in several places now, but should be used everywhere where proper sewage systems do not exist.

THE TEACHING OF HEALTH IN SCHOOLS.

BY L. BEHARI LAL BHATIA, M. Sc., F. Z. S.,

Assistant Professor of Zoology, Government College, Lahore.

There is no saying oftener repeated in educational parlance than *mens sana in corpore sano* (i. e., a sound mind in a sound body) and that education is the drawing out of all the faculties of a child. If we educationists know our business properly, the educated classes should be the healthiest in the community, and children receiving education at school possess better health

than their less favoured brethren outside. Yet the complaint is often heard, that the present system of education undermines the health of the scholars. Whether this complaint is justified or not, it certainly behoves a body of persons engaged in the noble task of educating young people, to ponder over the subject of the health of the scholars and the best means that can be devised to inculcate health and healthy habits among the school children. The children are placed under our charge, and it is expected that we shall make the best of the material that we can. If the sayings I have quoted are matters of earnest conviction with us, the physical, mental and moral development of the children should alike receive our attention. These children, when they grow and leave our schools and colleges, should be men possessed of a healthy physique, cultured mind and a balanced judgment. And this not merely for their own benefit as individuals. They are expected to serve as beacon-lights for the rest of the community and realising high ideals among themselves strive for the betterment of their fellow countrymen. It should be unnecessary for me to refer at length to the conservative prejudices, and fatalism of the people, their ignorance and disregard of the most elementary rules of domestic and personal hygiene, the insanitary conditions of our towns and villages, the high and indeed appalling rates of mortality, and the great misery and economic loss that these conditions entail. Public health authorities both in England and in India are agreed that sanitary education is the foundation on which all progress in public health matters is based. Some years ago, Prof. Kenwood, an eminent public health administrator, and Prof. Chadwick, Professor of Hygiene in the University of London, stated as his conviction that "modern public health policy is becoming more and more an educational campaign—for above all the community needs knowledge." In his opinion "it is necessary to develop to the utmost the *educational* means at our disposal, for if we go to the root of matters there is but one remedy for most of our social evils (including preventible ill-health) and that is education. While in the larger activities public bodies can assist, the full betterment desired can only come through knowledge which the individual himself will apply to his own intimate circumstances." If this is true of England, it is far more so of India, where the ignorance and illiteracy of the masses have definitely stood in the way of rapid progress in sanitary matters. In support of this view, I may also refer to an opinion expressed by the late Surgeon-General Sir Pardey Lukis, Director-General, Indian Medical Service. He pointed out that although the important discoveries and the vigorous prophylactic efforts that had been made in India had resulted in a very accurate knowledge of the measures necessary for dealing with plague and malaria, even a modicum of success could not be hoped for unless the people themselves were willing to co-operate wholeheartedly in the campaign. Further that "this active co-operation will not be secured until the people have learnt to

understand and to have faith in the principles on which those preventive measures are based, and that their education on these matters is a primary and essential condition of success." The importance of teaching of hygiene both in the interests of the individual as also in the interests of the community to which he belongs, is admitted on all sides, and there can be no doubt that an effort to cultivate a health conscience among the masses is the most powerful agent for promoting public health that we possess.

How far are the schools to take their share in this general movement of public uplift? Is Hygiene a suitable subject for study in the schools, and if so for what standards? How are the scholars to derive the maximum benefit from any teaching of Hygiene that may be provided at schools? How far should it be a training in healthy habits rather than formal instruction? How are the teachers to be equipped and trained for this important task? These and many kindred questions will arise in the minds of every practical thinker, and I shall attempt to discuss these questions in the brief space of time allotted to me.

Training and Formal Instruction.

I think it will be readily agreed that to have been trained in healthy habits from early childhood and to possess good health and lead a healthy life is infinitely better than to have received any amount of formal instruction in Hygiene or to have studied a vast amount of literature on that subject. Habits play a very important part in our life. Every teacher has known examples of boys who are very studious and those others who are excessively fond of games. The studious boy knows that it would do him good to take part in games. He could possibly write a brilliant essay on the value of exercises, if required to perform that task as a class-room exercise. Yet he finds more pleasure in perusing his work than in play. The other who is fond of games is found to indulge in play very often to the detriment of his studies.

Prof. Kenwood considers the provision of suitable hygiene training at school—the only time when all citizens are under control for training—as one of very great importance. He holds the view very strongly that average girls and boys up to 14 years of age are likely to take but little active interest in their own bodies by *teaching* them hygiene. We must seek to develop a health conscience by checking bad habits and encouraging good ones. *That is the goal of our hygiene training at school.*

Up to and including Standard III, Prof. Kenwood advocates nothing more than training by object-lessons and corrections, but in Standards IV and V in addition, the nature and importance of laws of health should be simply and tellingly impressed in

occasional short talks, which would never seek to do more than to produce a particular practical result in training. The aim of these incidental talks would, where possible, be impressed upon the scholars by means of object-lessons (as, for instance, the correction of a dirty boy, the correction of a dirty habit, the opening of a window, &c.) or an introductory story may sometimes serve. All technical or scientific terms would be avoided in these talks, which would always be illustrated by facts and objects which fall within the range of school and home life. He further advocates that a scholar in each class-room occupied by children over 10 years of age, should be appointed as the "sanitary monitor" for the week. It would be his duty to see that the ventilators were open, that the class-room was well flushed with fresh air upon every available opportunity, to report if cleanliness did not obtain, if dust had accumulated, and if all the sanitary demands were not met in the sanitary conveniences provided. For the higher standards, since it is the policy to put hygiene on the school time-table, as a set subject, for the last two years, the training of the boys and girls would be carried a step further."

I would like to be pardoned for having quoted the view of Prof. Kenwood at such length, but I have felt that in placing my own views before this Conference, I might as well fortify myself by quoting eminent authority.

For many years I have given serious consideration to the problem of sanitary education both in schools and for the wider public outside. Keeping in mind the emphasis to be laid on hygiene training I would recommend some such scheme as the following for the various departments of our schools:—For the lower primary classes only correctional object-lesson should be aimed at. Efforts should be made by the teachers to maintain among their pupils a fair standard of cleanliness of skin, nails, hair, teeth and clothing. The necessity of occasional baths and change of underclothing should be impressed; dirty scholars should be sent back home, and told to come back after cleaning themselves; bad and dirty habits—namely, spitting, committing nuisance, bad posture, &c., should be corrected. The same correctional efforts should be continued in all classes in the school in the higher classes a fault being made the pivot of an incidental talk. It may be sympathetically suggested to the poorer boys in the class that there is no shame in washing one's clothes with one's own hands, and that simple and clean clothes are more honourable than gaudy but dirty ones.

In the fourth primary class, each child might usefully be provided with a short printed set of rules for his conduct at schools, at play, and at home, and these should be explained by the teacher as occasion permits or circumstances demand. These rules might be printed in the form of small booklets with substantial covers, each costing not more than a few pice.

In the middle school classes, the system of appointing a student as the "Sanitary monitor" for the week should be introduced and hygienic observances should be supplemented with occasional talks. These need not be regular set lessons included in the time table, but may be introduced as brief conversational digressions during the time allotted to other set subjects. As repetition is necessary for forming lasting impressions, question should be asked (and invited) from time to time. Some of the subjects so taught, can be set for composition exercises, and an opportunity taken in a supplementary talk to deal with facts which do not appear, from the composition sent in, to have been sufficiently grasped. In the seventh or eighth class an easy Health Reader may be introduced, but no formal or scientific explanations should be attempted, the aim in this general teaching for all boys should be to treat Hygiene as the art of healthy living and not as a science. It should be sufficient to point out in the simplest possible language, the good that comes from the obedience to the laws of health and the harm that comes from neglecting them. Certain rules and facts have to be applied in a commonsense way to everyday life, and an eye must be kept on the actual circumstances on the homes of the scholars.

I am aware that there is an easy Health Reader called Life, Light and Cleanliness, already in use in our schools. It was written by an expert who had the necessary enthusiasm for his task. It is in the form of a story book and has been translated into all the vernaculars of this province and several of the South India Vernaculars besides. I understand that it is prescribed as one of the supplementary books for the 4th and the 5th classes. As it is alternative with other ordinary Readers many schools do not use it at all. The teaching of this book I believe is generally entrusted to the vernacular teacher, whose general background of scientific knowledge is very poor. The vernacular teacher in a primary department is not a likely person to expound the valuable truths contained in this book with any degree of conviction and enthusiasm. The book is often read through, but I am not sure if any effort is made by the children to grasp and remember the contents. I am an admirer of this book, but cannot help pointing out that the contents are such that they cannot be profitably presented to the tender minds of boys of 9 or 10 years of age. I am aware of the fact that by far the greater part of preventible mortality and ill-health in India is from such infectious diseases as malaria, plague, cholera, tuberculosis, and small-pox. As a person deeply interested in the cause of sanitary education, I earnestly desire that the knowledge of the elementary principles on which the prevention of these diseases rests be spread broadcast, and the maximum number of people be educated in these truths in the minimum of time. Yet even this enthusiasm for a good cause must bow to sound educational methods and principles. The knowledge about prevention of malaria, plague, and cholera is very

important, but boys of 9 or 10 are hardly the persons who can feel any interest in learning "How to guard against cholera and how to deal with it when it does occur" (Chapter 18) or "Malarial fever. How caused. The germs are in the blood. How mosquitoes cause malarial fever. How mosquitoes are bred. Things that may be done to prevent mosquito breeding". (Chapter II).

For boys in the primary classes it should be sufficient to learn how they are to act in order to be healthy and strong.

I would therefore suggest that this Health Reader (Life, Light and Cleanliness) be prescribed for compulsory study in the VII or VIII class as also for all Adult Schools. Further that the teaching of this book should be entrusted to the Science master or some other well-informed senior teacher and not the average vernacular teacher.

For the VIII Class, some elementary physiology and hygiene are also included in the scheme of General Science teaching in the middle schools. This is very valuable, as the facts of elementary Physics and elementary Chemistry already learnt can be applied, and the student is enabled to understand the comprehensive character of Science. The formal and scientific study of hygiene can be reserved for the Matriculation classes, where it can be taught, in a rational manner in conjunction with Physiology. The number of students taking these important subjects is not large, and where adequate arrangements can be made for teaching Physiology and Hygiene a large number of students should be encouraged to take these subjects, both for their intrinsic value as science subjects and for the utilitarian value of the knowledge gained. I am submitting another paper on the teaching of Physiology and Hygiene to Matriculation classes before the Science section of this Conference, and consequently need not say anything further on this subject here. In the same paper I shall discuss the subject of the training of teacher in Hygiene.

Indirect Teaching.

The provision of suitable school-buildings, dormitories and play-grounds is in itself an object-lesson in hygiene training for the scholars. The buildings and surroundings in the cases of the majority of schools are healthier than in the average Indian home, and in the majority of cases, boys are in healthier surroundings while they are at school than in their homes. If anything, the lower standards of living of the students and the teachers themselves react unfavourably on the conditions in the schools. If sanitary conditions are maintained in the school, the training of the child in the right way of doing the right thing, coupled with his natural assertiveness, will generally ensure that much useful practice is transferred to the home. During the last 25 years I have noticed a marked progress in the standard of living in the

homes of the educated Indian gentlemen, and I am inclined to attribute it, at least partly, to the indirect influence of the conditions in the schools and colleges, and their hostels, and secondly to a desire to imitate the mode of life of the Europeans, with whom we are brought in contact more and more as the result of general educational progress. But the lesson I would wish to inculcate is that hygienic living is possible as much in the cottage of a peasant as the palace of a prince, if we only know the art of living. The provision of games and playgrounds, the Boy-Scout and Girl Guide Movements in the schools, and the University Training Corps in the colleges, are all agencies working in the direction of the improvement of the physique of the individual scholars who participate in these movements. But very often in our enthusiasm to put forward good teams, the needs and interests of the weaker boys are apt to be neglected.

In the interests of these weaker boys and for the safety of the healthy children I would urge the medical inspection of school children on a more extensive scale than is at present in vogue. We cannot however afford the expense of the inspection merely for the luxury of having statistics available regarding the prevalence of certain forms of diseases among school children. To be productive of full benefit, the co-operation of the parents and the teacher should be enlisted in the case of those who are found defective. As is now generally done in England and other Western countries, information should be given to the parents of the boy, concerning the trouble detected, and medical advice offered if desired by the parents. The class teacher should also be expected to keep a special eye on such children, and to see that the trouble does not grow worse as the result of pressure of home task, or participation in forms of exercise which are not suitable for the particular child.

The part the schools should play in the general movement for public health propaganda.

And now before I conclude my paper, I should like to make a few observations regarding the part the schools should play in the movements for public health propaganda. The school authorities may be expected to interest themselves in the work of the various agencies engaged in this task, firstly inasmuch as the activities of these bodies are intended to benefit the scholars themselves, and secondly the co-operation of the teachers and the students is solicited for the purpose of reaching the masses. A school should be the centre from which all kinds of influences for good should radiate in all directions. The keenness and enthusiasm of the young students is unbounded and the elders have simply to give them a proper lead and direction, in order to turn the energies of the students into channels of useful social service. We do not lose anything in sharing out knowledge with our brethren.—It is a torch from which millions of

torches can be lit, and like mercy it is twice blessed, it blesseth him that gives and him that takes. Even at the rapid rate at which we are now advancing in the Punjab, it will take at least ten years to reach the goal of general literacy, and literacy by itself is not a safeguard against the ravages of epidemics. But till that goal is reached shall we sit with folded hands and hope that all will be well, when people are literate? Have we the heart to see millions of people dying every year from the ravages of Plague, Malaria, Cholera and Tuberculosis, when they could easily save themselves from falling a prey by a little knowledge on their part, and that knowledge correctly employed? Sanitary education of the people can ill afford to wait till the general level of literacy is raised among the people and in the best interests of our country, there is the urgent need for waging a war against all forms of communicable and preventible disease, and in the army necessary for waging this war, the teachers and the taught can all serve as volunteers. Let no headmaster imagine that the time of the scholars will be wasted, if they attend classes in Home Hygiene or First Aid organised by the local centre of the St. John Ambulance Association or Junior Red Cross movements, or a branch of the Society for the Propagation of Scientific Knowledge. The classes should in fact be organised in all schools, as there is certainly need for learning such useful subjects, and on a voluntary basis. The teachers and the students well equipped through the instruction they themselves have received, can play a very important part in the celebration of the Health Week, which through the kindness of Lady Reading has been made an annual feature of our work. The students in staging a health drama, or learning some recitations, or parading the streets as a procession singing health songs, or staging moving tableaux, or carrying banners and flags with appropriate health mottoes, will be receiving a very useful training, *viz.*, in rendering such service as they can to the community to which they belong.



“TUBERCULOSIS AMONG SCHOOL CHILDREN.”

By R. B. DR. MAHARAJ KRISHNA KAPUR, D.P.H., D.T.M. & H.L.M.S., Lahore.

It is an unfortunate but undeniable fact, that educational institutions must bear a considerable share of the responsibility for the spread of consumption amongst children and students in India, during the past fifty years. Whilst education has been doing much to diffuse among people knowledge of better ways of living, the institutions and methods connected with education have not always been above criticism. In fact in many institutions notwithstanding all efforts for the improvement of school sanitation serious errors continue to exist, that have been

contributing towards the insidious spread of Tuberculosis amongst their inmates.

It is not possible for me in this short discourse, to discuss the different statistical aspects of the question. Suffice it to mention that enquiries so far made indicate that in many schools, orphanage schools particularly, mortality from Tuberculosis has been ten to twenty times the mortality that prevails among children under the age of 15 years even in cities badly infected with Tuberculosis. Moreover the number of deaths occurring in a school indicates only a small portion of the mischief done, as in Tuberculosis, the harm sustained by the fellow students will be enormous, even if contacts escape the immediate results of infection. I dare say if a regular and thorough enquiry were made of the after history of school children, who have been in such schools it is bound to show clearly, that the toll taken by the disease is not limited to the number of those that die in their school life.

It is an admitted fact that whenever a number of persons, socially different, and geographically apart, are, by various circumstances, forced to a sudden change of environment and have to come in close contact with one another, as is the case with factory hands, school boys, office hands and inmates of hotels and boarding houses, infectious diseases are more easily communicated and have been known to spread in an epidemic form. Tuberculosis is the disease, that more than any other, tends to come to the fore as a consequence of this somewhat sudden change in the conditions of life.

An Indian child in his own family is under very little or no restraint. He is very often under no discipline and is allowed too much freedom if not too great a license, inasmuch as he is not bound by any hours of rising or going to bed, and there is no restriction for him as to the time of his feeding or the number of his meals. He has also full liberty to run about and play about in the streets and in open air. His admission into a school more particularly in a boarding school, involves such a sudden change in his habits and environment, that the unstable frame of a growing child is very easily affected, unless sufficient care and precautions are exercised by those who have the charge of the little ones. No undue pressure should be inflicted, and the child should be gradually and smoothly weaned from his old habits, and brought to adjust himself slowly to the new conditions of restraint and discipline. Even monkeys and certain other wild animals have been noticed to develop consumption, when admitted in the zoological gardens, unless very scrupulous care is taken to protect them from the evil results of the sudden change of the conditions of their life.

This then is the first duty of the schoolmasters the neglect of which, in several cases (in the past at least) has driven young

children into the clutches of Tuberculosis. Little children must be dealt with with much more sympathy and kindness and the proverbial school masterly rigour must take the place of paternal kindness very very slowly. Do not overdo things in your zeal for the immediate correction of a child's bad habits that have grown with him, but try to bring him round very gently and softly.

Defective school buildings and over-crowding in the class rooms are a great menace. Perhaps you will think that I am deplorably ignorant and antiquated, as in these days, one often comes across palatial school buildings lavishly erected with arrangements that apparently leave nothing to be desired. This I concede may be the case in several favoured institutions but so long as there remains one school that is insanitary, the educationists particularly, and the nation at large, continue to be guilty of child slaughter. Let no mother feel the remorse that by sending her child to an educational institution, she has paved its way to disease and death.

In planning school buildings where a large number of children are to be accommodated, it is necessary to bear in mind, that the mere bringing together of so many little ones, in a closed roofed space, involves of necessity two dangers: 1. That of infection; not merely Tuberculosis, but of other diseases as well, such as Catarrh, Measles, Small-pox, etc. 2. That of lessening the power of resistance to disease. The one great safeguard for both these risks is in the provision of fresh air in abundance; the necessity of this is greater, as the children have been more accustomed to being in the open air at their own homes. It must be within the living memory of most of us, that the old school buildings, where many of my age and most of my elders had their schooling, were buildings in which ventilation and provision of fresh air were simply ignored. The school buildings were designed with the paramount idea of securing protection from the extremes of heat and cold. The best way to attain this object was taken to be isolation from the outside air.

It is true that a large number of such schools have been modified or have been rebuilt on modern hygienic lines but it is no less true that a good many still remain—in small towns and villages particularly—that are an obvious source of danger both to the teachers and the pupils. I venture to express the hope that the recent step of the Punjab Government to provincialize many of the Municipal and District Board Schools will do a lot to help in the improvement of their sanitation.

Enormous progress has no doubt been made as regards increasing the accommodation and ventilation both in the classrooms and hostels of our schools, but when the palatial buildings of our schools and colleges are rising up, and the class rooms are being provided with elaborate and expensive arrangements

for ventilation and protection from bad weather ; one often feels that neither in the interests of the health and growth, nor in the interests of sound and suitable education of the scholars such an extravagance ought to be necessary or permissible. Even if this economic side of the question be not within my line, I can appropriately advocate the advantages of open air schools to-day. In an open air school the ventilation of its class rooms and living rooms is carried on by natural means as opposed to artificial methods.

Now-a-days we design and build our class rooms, according to accurate scientific calculations of air space and floor area for each child together with inlet and outlet areas for ventilation. The construction is very massive with thick and impervious walls, as well as with tight fitting doors and windows ; so that God's great gifts of pure air and sunshine are let in with very great restrictions and limitations.

In open air schools classes are held in verandahs or open sheds or in the school park or gardens. To protect the children from severe cold or intense heat, class rooms can be built cheaply, with inexpensive arrangements to flood them with fresh air from outside in abundance so as to keep the air within almost as clean and fresh, as the atmosphere outside. The health and growth of children always improves wonderfully in these conditions. Even children predisposed and inclined towards Tuberculosis or otherwise deficient, benefit enormously in the open air schools. This Conference will do a lasting good to the cause of education and public health if a Committee is formed to-day to introduce open air schools in the Province, and propose designs and plans of its buildings suitable for climatic conditions of the Punjab.

A few more suggestions briefly stated will cover the span of 15 minutes allowed to me. Medical inspection of school children has not yet been universally and effectively introduced in our schools ; only a beginning has so far been made. Often early cases of tuberculosis in schools and boarding houses go undetected ; the infection therefore has been known to be carried from one boy to another.

A regular cadre of school Medical Officers ought to be organized and must form a necessary part of the school staff ; while the teacher look to the mental development of the pupils, the Medical Officers will keep an accurate record of their physical development. Any case of loss of weight or in fact lack of proper increase in weight, must be noted so that if a pupil is losing or is not putting on sufficient weight and is at the same time showing signs of failing appetite, lassitude and disinclination for work and exercise, especially if accompanied by a slight rise in evening temperature, unaffected by quinine ; suspicion

must arise of early or incipient tuberculosis. Immediate segregation in open air conditions will save the life of the unfortunate victim, and prevent in time the spread of tuberculosis among other children in the school or in its boarding house. Constant medical attendance will thus provide a safeguard not only against tuberculosis but also against all other infectious diseases. The Medical Officer will, besides this, be in a position to ascertain early, any mental or physical infirmities of the children and regulate dieting, exercise and hours of study and sleep according to their mental capacities and the conditions of their health. Thus a harmonious and healthy growth of their mind and body will be ensured, which admittedly is the aim and ideal of good education and educational institutions. A medical man is always a more competent person to be placed in charge of boarding house. His medical training, especially equips him to observe and remedy the various defects, deficiencies and drawbacks in school hygiene that singly or in combination, may have to do with the spread of tuberculosis in the institution or may lead to the undermining of the physique of school children in such a way as to predispose them to this fell disease.

Besides the main items discussed above I may also mention careless spitting, insufficient and unwholesome food, errors in curriculum, covering the face during sleep, errors in clothing, lack of suitable and sufficient physical exercise, defective school desks and mode of sitting, early marriage, and ignorance of sex laws, as some other significant causes that contribute, more or less, to the spread of tuberculosis through the agency of educational institutions.

One often painfully observes, even in a central place like Lahore, more particularly in private hostels and boarding houses, a number of students overworked in unhealthy surroundings, underfed and often without open air exercise or any other relief from the dull monotony of the prevalent cramming system; slowly developing consumptive tendencies and by the time they terminate their educational career they become neither very healthy nor very happy members of society.

This sad and sorry spectacle has been my plea or justification in venturing to address this distinguished gathering of the educationists of this province. I beseech to pay greater attention to this subject so as to find ways and means to eradicate this canker that is contaminating your magnificent mission and is marring the best results of your noble efforts.

ARTS AND CRAFTS—THEIR PLACE IN GENERAL EDUCATION.

BY MR. J. COWIE.

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If the deliberations of this section of the Punjab Educational Conference are to be of any real value, we must take account of things as they are, and the causes which have produced them, and seek for progress from the present condition in a way which shall be in harmony with what has been achieved in the past.

We must recognise the fact that Education in India is controlled by a State system, and in fact modern education was initiated by Government to an extent which perhaps has no precedent elsewhere.

In Europe a system of Education existed in a very vital way for centuries before the State took up the problem and thus there was an inherited long tradition of educational principles clearly established, and a system possessing remarkable vitality and the state merely at first extended existing methods, and increased sources of experience and information without introducing any new cultural conceptions at all.

On the cultural side, broadly speaking, in the West the State affords financial aid and insist on a certain standard of efficiency, tacitly recognising the authority of those institutions devoted to cultural aims which existed prior to state education. The various technical colleges and art schools were largely founded by far-sighted private citizens, municipalities, trade guilds and so forth so that they too have the benefit of an initial impetus which largely influences their subsequent activities. The case in India is almost diametrically opposed to this as the present system of education was initiated by the state without the existence of any effective body working on lines even approximating to those which the state could take up.

Now to estimate rightly the result of this state system or any other system we must consider what was the aim of those responsible for its initiation and I believe we shall find that culture was not a primary aim. Nor do I think it well could be, for culture is bound up with religion and national political conceptions.

We live in an age of confusion. Culture has no universally recognised foundation as liberty of conscience and democratic Government must permit of a very wide range of different and even antagonistic cultural conceptions. Those who rise to eminence in the world do so for other reasons than their culture, indeed many of them have little or none. I compare the

present world age with that in Europe between the fall of the Roman Empire and the rise of the Feudal system, commonly considered a dark age, but indisputably, a vital one out of which rose the great system of mediæval Europe. Even the spirit of destruction is a creating spirit, and in an age where so many contending factors in religion and politics surge around the problem, it is well to seize hold of realities and leave culture as an entity to find its own feet and that is what the Government of India did in founding its system of education.

Its initiators were foreign in religion and political conceptions as well as in blood and their inherited culture did not carry conviction to the minds of a people whose native culture or cultures were of very ancient origin and of a high order, though their manifestations and influence had at that epoch sunk to a low level.

I suppose that the primary duty of Education is civilisation, or the fitting of its pupils to become useful citizens by the development of the arts and refinement of life and the first aim of state education was declared to be to train Indians to take part in the administrative work of Government. This has been magnificently attained and was in reality neither more nor less than a superior form of vocational education.

So well has state education attained this that the supply of educated men capable of doing administrative work exceeds the demand of Government, and Commerce also is unable to absorb all the labour available. To this is due much of the unrest of the educated classes. They submit their sons to what is in fact a vocational training and when they have finished it they find no jobs. Now to succeed, a system of Education must not only have precise aims and a conception of a certain state of society which it desires to bring about, it must be in accord with the mind of the people to whose children it is applied. Originally this was so in India—Government proposed to train Indians to serve them in the administrative work of Government, and the people of India wished their sons to take up such work as it was honourable and lucrative employment, and they foresaw that it would greatly enhance their political status also.

India possessed of modern information, hoped to rise from the position of a subject nation and Government itself expressed the hope that the Indian people should so rise from the position of profitable subjects to that of more profitable allies—this without infringing on their indigenous cultures, merely by producing a healthy, efficient and modern administration of a country of vast potential wealth, whose people, possessed of modern Western technical information should be in a position satisfactorily to exploit the possibilities of their country.

And this I venture to say is where Education has not yet succeeded. Doubtless progress has been made, but Education has probably contributed less to this than many other factors such as Forest, Administration, Railways, Irrigation and so forth. The cause of this, I believe to be the fact that, owing to lack of funds, only one class, *i. e.*, the administrative, professional and commercial class, has received real benefit from Education, and the country is thus top heavy with commercial and administrative ability, and in technical matters lags far behind. The education of the working class has lagged far behind that of the middle class and therefore a large section of the middle class sinks in earning capacity because of the low standing of the classes below it. Public money was spent on one sort of Education leading to one sort of future, therefore, the intelligent members of the working class who were able to educate their sons, educated them in the only way available. The educated working class boys rose to the lower middle class which was already full to repletion, whilst the labouring class remained at its old low standard, or even sank lower by the separation from it of its more intelligent children. Now it is clearly impossible for a state to be healthy and prosperous in one part of its population, if the population as a whole is not well balanced and I contend that the poverty and distress of the educated middle class can only be met by improving the standard of the labouring class and this concerns not merely the departments of Forestry, Industry, Transport and Agriculture but to an even greater extent, that of Education, for without intelligent artisans, these departments are seriously hindered in their beneficial functions. Now the past history of state Education has rooted in the Indian mind the impression that Education is a means to a job and therefore no system of education for the working classes which does not offer prospects of more profitable employment than can be obtained without Education will ever have any value in the minds of the Indian working classes and they are justified in that idea.

Why should we expect a workman whose son can help him in his work whilst learning his trade to give up that help, to say nothing of the expense involved in sending him to school, if at the end of his school life he will be able to command no bigger wage and perhaps be even disgusted with the idea of working at a trade ?

In the West the social organisation is such that a boy of ability can hew out for himself a career if he has a general education, but in the East only a person of extraordinary character and force of personality can do this at present, and merely to give ' General Education ' to the masses I consider a highly dangerous experiment.

A lad who leaves school early to take up work is not ' educated, he has merely received the skeleton of Education and to

constitute a literate working class under present conditions would be merely to expose to the first spark of sedition or inter-communal agitation more inflammable mass than exists already.

Now since religion and all its cultural influences are divorced from the state educational system we must include practical education—the purveying of information of practical monetary value both to satisfy the public mind and as a cultural influence. Professor Lethaby has pointed out that every man who is sincerely doing the best he knows at any useful work is attaining a measure of culture thereby, for his own good work and progress gives him a small, but useful standard to gauge the work of others. The general education should be so framed as to lead naturally to industrial and higher technical instruction and drawing and hand work are essential for this. The science of drawing which applies to all work—to make a boot, a table, a suit of clothes, a kettle, a stove, any object of common utility, the mental and manual faculties developed by drawing are essential. Art as a cultural expression by graphic and plastic means, is also based on drawing or the faculties associated with it, but only a highly trained specialist in drawing can teach drawing efficiently.

To expect an ordinary class teacher who has received some instruction in drawing to produce good work is hopeless. Poor drawing is worse than none, for it perverts the mind, instils fatally the idea of “near enough.” All children love to draw and to model so to teach these subjects is relatively easy but the teacher must be able to draw better still if he can paint also. It would be far better to have a peripatetic Drawing Master visiting a series of schools for one period a week than to have a half-trained teacher in each school giving many periods. The first would at least teach a little well, whilst the other merely hinders the mind from developing on right lines whilst affording the hand a perverse facility for misstatement.

You would never permit a teacher to allow his pupils to give glib false answers in mental arithmetic without corrections, yet palpable falsehoods or measurement, proportion and so forth are constantly perpetrated in drawing.

There is no calling in which knowledge of drawing, both free and by means of instruments and the knowledge of form and the sense of measurement which it inculcates, is not of great utility, and to many it is absolutely essential for real success, whereas as the number of people who can use it as a means of expression is extraordinarily small.

Drawing cannot be taught by theory. I consider that little would be lost by burning every so-called “Drawing book” that was ever published. Drawing can only be taught by demonstration

and personal supervision and the personality and skill of the teacher is of far greater importance than his pedagogic training. Lectures on drawing are also of little use. From experience I am of opinion that people differ very widely in the way in which they perceive things. Several artists painting the same subject will generally produce different results, though all may be perfectly correct in drawing, tone, and colour. The reason is the way in which their faculties of perception and receptivity differ. If this is true of trained men, how much more of the untrained mind of a child! It is necessary therefore to deal with pupils individually, affording their guidance in accord with their various mentalities. Your teacher therefore must be able to realize from a pupil's work the way in which his mind operates, the way in which he perceives things, and only a long and serious course of training in art can give this discernment. For these reasons I deplore the idea of giving instruction in drawing by any other than a highly trained naturally intelligent and educated teacher, whose status and position in the educational system should be recognised as a very useful and honourable one, whereas at present the Drawing Master is regarded as a sort of ornamental hanger-on the educational system.

Now to turn to the crafts, which I consider of even greater importance. Here the Department of Public Instruction has done very little. Manual training is taught, as an educational subject, but Industrial Education so called is in the hands of the Industries Department.

In this connection, we find prevalent what I consider to be an erroneous view, namely, that Manual training is a purely educational matter intended to train the eye and hand, to build up character, and to assist mental training by providing concrete examples of matters generally discussed and dealt with by means of abstractions, whereas craft, or Industrial Education is a matter of providing specialized information to persons sufficiently educated to avail of it. There is some truth in this view, but it is by no means the whole truth, and in the Punjab and India generally it has resulted in the divorce of artistic and industrial education from general education to their mutual injury. This divorce probably arose owing to the unfortunate history of the teaching of drawing and manual work in school both abroad and in India. When these subjects were first introduced in Europe artists and craftsmen, such as were available, who had no experience of the art of teaching, were employed as teachers of these subjects, so that their minds were occupied with the material products of the work, instead of with the human product, *i. e.*, the mental and moral effect of the method of teaching these subjects on the pupils. Subsequently when the ill effects of this were perceived, teachers who were neither artists nor craftsmen were selected on account of pedagogic training or experience, and the pendulum swung

to the opposite extreme, which still tends to prevail, as much utterly false craftsmanship and unsound draftsmanship is even advocated by those pedagogues, who provide text-books and other aids to instruction for teachers of these subjects, who themselves have rarely sufficient technical experience to realize these defects. The result of this is that when a pupil leaves school to undergo some vocational training he is usually confronted with an outlook utterly foreign to him, and has to unlearn much of what he has acquired. In these circumstances the concentration of artistic industrial education in the hands of the Department of Industries is probably the best compromise possible, but it is only a compromise and an unnatural one at best, because education and information cannot be divided without grave injury to the pupil. The present system is as logical as to separate the teaching of writing and speech from the teaching of grammar, because grammar is badly taught. Manual Training is the grammar of all that craft work and sound drawing of all that art work considered as expression by graphic and plastic means. The loss culturally is immense, for the soul history of all races in all ages has been truthfully written by the artists and craftsmen because they wrote it subconsciously. Literary records are less reliable because they must express the personal prejudice of the author, whereas the works of artists and craftsmen must necessarily conform to the general mind of the age as they are produced for the generality of the people of their age.

I urge therefore the closest co-ordination of all drawing and manual teaching, from the kindergarten stage up to the highest artistic and craft teaching available. There should be a sequence throughout the history of a pupil's work on these lines as there is throughout his educational history on the literary side.

To those who will follow an artistic and industrial career such teaching would advance them smoothly and normally throughout their school career and to those who do not take up such careers, it would be invaluable as giving them a standard of judgment in the matter of all manufactured goods because sound craft knowledge in one craft gives understanding of craftsmanship in all other crafts.

Well-designed exercises should subconsciously foster an appreciation of design which is an essential art less generally understood than any other, and a wide-spread knowledge of which would do more to elevate the industrial level of India than any other factor.

A co-ordinated scheme of studies would in addition broaden the basis of general culture, which is at present limited almost entirely to literary attainment. At present artistic and industrial education is a poor relation of general education, whereas it should

be regarded and treated as an equal member of an honourable family.

I do not suggest that there should be any special trade or technical teaching at any point below that of the middle standard industrial schools and these may well be left to the Industries Department as such training concerns that Department directly, but sound craft methods should be inculcated from the beginning. Paper, card board and clay modelling should be building up processes and the illustration of mechanical principles introduced at a very early stage.

Elementary structural principles with regard to material limitations should be comprised in wood or metal work. Appreciation of true form and structure must be inculcated in drawing exercises of an interesting nature from the beginning, whether a pupil becomes a farmer, a blacksmith, a college professor or an advocate. His drawing and manual training will have had a definite influence on his mental equipment, and nothing he has learned will ever require to be unlearned again.

The Department of Public Instruction has at its service an organisation for the production and administration of courses of instruction, text-books, and an Inspectorate to see that the approved schemes are duly carried out. On the artistic and industrial side, such an organisation scarcely exists and schools are spread experimentally to see what can be done. This is naturally costly considered in relation to the results hitherto obtained.

The efforts of the Industrial Department in this direction, considering the experimental nature of the work and the complete absence of previous experience on the part of any other department, have been more successful than one would expect in view of the fact that the students are recruited from the very poorest class of the artisans and others, who have no hope of their children being able to benefit from the general education provided by the Department of Public Instruction, but as these schools have to recruit these lads very young, the Industries Department is compelled to supply general education also which in my opinion is not the proper function of that Department. It is however necessary to undertake the work since there is no co-ordination between the two departments. I submit that the educational authorities might give, in industrial centres, an industrial bias to their general education without infringing on the educational value of the instruction given by providing improved instruction in drawing, by means of highly trained Drawing Masters and Manual Trainers in a variety of subjects, the courses of instruction being designed as a true introduction to practical crafts and preceded by kindergarten work also possessing the same tendency.

This necessitates the preparation of carefully designed courses of exercises, totally different in character from those in use in the West where the public mind expects from this type of training a totally different result from that which the Indian mind expects. These courses would be by no means inferior to existing ones in *educational* value, because that value depends on accurate work and the exercise of the intelligence involved in producing such work. There should be no difference in outlook between the Department of Public Instruction and Department of Industries, whose ultimate aim should be identical.

To conclude, I would point to you the artistic relics of India—The Hindu temples, the Mohammadan mosques, the ancient weavings, gold and silver smithy, the paintings, all the treasures of the museums of India—and would ask you if the men who produced them were not more educated, more cultured, and even more civilised in the sense of intelligently occupying a useful place in the state, than their descendants of to-day who cannot produce these things and who too often do not even possess the desire to produce them. That spirit which animated them must be revived, and education rightly conceived can alone awaken it, but without art and craft instruction throughout the whole period of education, this cannot be accomplished. However good the system of industrial instruction provided may be, if the Department of Public Instruction does not collaborate, it will labour at a great disadvantage. It is time to extend the field of operation of Education. Its brilliant success in producing men capable of one type of activity must be reproduced in other fields and at the present stage I submit that the craft, or industrial field is one calling for immediate attention and the development of which would react favourably on the whole life of the country. Art including the artistic crafts is a manifestation of culture, and I have sought to indicate a very palpable truth, namely, that a state system of education cannot speak or act and never has so acted in any country without authority in cultural matters unless the system of government existing is the concrete expression of the mind of a country at one with itself both as regards political principles and religious outlook, as was the case during the Feudal period in Europe and probably during the golden age of Indian culture.

Therefore the best that the state can do to-day is to provide sound technical instruction, which is the basis of all artistic manifestation, and secondly, to enable the national mind to evolve towards cultural unity by affording patronage to those artists who by the expression of their own personal conception in their art works, whereby different but not necessarily inimical ideas may be ventilated, and by their reaction on the public mind advance the re-emergence of cultural unity from the present state of confusion.

Art galleries and lectures by philosophers of art will tend in the same direction. This of course belongs to the sphere of Adult Education rather than that of children, and for these, sound elementary instruction in drawing and simple craft work is an essential, I have sought to show how urgent this is for material reasons, and its beneficial effect would be equal in the cultural sphere because sound knowledge of any craft gives ability to judge other crafts and an intelligent knowledge of craft leads to appreciation of art. In the great artistic epochs there has been no dividing line between the crafts and the 'fine arts' and in reality there is none to-day. The division is a snobbish one due to the greater display of skill in the 'Fine Arts' but fundamentally there is no division. The greatest of the Hindu artists are unknown by name, and in ancient Greece, Phidias was known as "the Moulder" and during the Gothic and Renaissance period the great artists did not scorn to practise the applied arts and were as famous in that direction as in painting, sculpture and architecture. That is the spirit we need to recapture and the first step in that direction is to replace *good work* in its true place in the scheme of education for all, and to stimulate the public mind as to the value of these things both in and out of schools. In a scheme of general education there is no need to introduce new crafts; those already taught in the Manual Training stage (wood work and metal work) contain in them the seeds of all manual crafts; the urgent matter is to teach them rightly. To introduce new crafts before the existing training is on a right basis would be merely throwing good money after bad. The things to cultivate during the period of general education are a true understanding of form, a respect of good work, and understanding of material limitations with regard to work. The elementary mechanical principles underlying all productive work, and an appreciation of the difference between work rightly and wrongly designed and carried out. And these aims can best be attained by putting on a craftsmanlike basis the subjects already taught in a tentative way. I am convinced that if this can be accomplished, the effect will in time be of far-reaching importance beyond the immediate objective.

THE PLACE OF MANUAL OCCUPATIONS IN OUR SCHOOLS.

BY LALA HARDYAL CHOPRA,

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[The address was introduced by indicating what was meant by manual occupations from an educational point of view, as distinct from vocational training. The speaker then described

manual occupations in his own school which works on the project system]. He said :—

Moga, you know, is a town of recent growth, in fact it is still growing. The Municipal Committee auctioned certain areas which had been divided up into plots for residential quarters. I took my children with me there apparently for fun, but I had another object in view. People belonging to different professions—pleaders, doctors, shopkeepers, schoolmasters, artisans and cultivators—all bought these plots eagerly. The children being local knew most of them and enjoyed the whole thing. In our primary school we had been working on the project system ; and we had just finished the post office project. The pupils had already established their own post office, appointed a post master and had put up a letter box. The postmaster had a busy time every morning, for he always found in the letter box a number of letters written by children either to each other or to the staff. Thus letter writing in real earnest was in vogue from the second class upward.

The next day, after our return from the auction, when we were talking over the event, an idea was suggested by a pupil, " Can't we make a *basti* like this in our school ? " The idea caught on and at once came suggestions for different sites which could be divided up into plots for the purpose. Ultimately an area under the pipal trees was selected. I suggested living as we did in a municipal area we could not undertake any construction, without municipal sanction. " But cannot we secure it ? " called out an enthusiast. " Possibly you can," I replied, " but it all depends on the decision of the committee." Then followed a little interesting talk about this or that influence that could be brought to bear upon the members to secure the sanction. Presently an application was drafted, of course under the guidance of the teachers, to the President of the Municipal Committee. The neatest was to go to the President. You can imagine the interest with which the application was written and the keenness with which the reply was awaited. Rai Bahadur Doctor Mathra Das, the President, took the whole thing good humouredly and got it sanctioned by the committee, on condition that the plan be submitted for formal approval. This brought in drawing. The area was marked out on paper and was split up into plots by children independently of each other. When they were brought up to me for scrutiny I suggested that they had neither made roads nor lanes and they did not expect people to remain always in doors. This caused a lot of amusement and presently we had a nice plan which, when sent to the Municipal Committee, was approved.

The area was now divided up according to plan. This brought in measurement. This was followed by the construction

of roads, lanes, and chief drains. A garden was first laid out into which the rain water would drain off. The plots were now auctioned and were taken up by different classes to build houses for all sorts of people—pleaders, shopkeepers, carpenters, kisans, weavers, oilmen, and teachers. Presently came an idea, “ Shall we have no school for the children of the *basti* ? ” The Assistant District Inspector of Schools was requested to open a school ; he very kindly consented to do so if the people were willing to build a school on the standard plan and the requisite number of scholars were ready to join. A school building project was taken up by the 2nd lower middle class.

Where to get bricks from was the next problem. “ Could not we make them ? ” I suggested. “ But we do not know how to make them,” quietly answered a small chap. “ But if you could show us the way I would make them for my house for certain,” remarked the son of an agriculturist, for he had seen his father make them for building a cowshed. A discussion followed in which it was decided to visit the brickyard near the kiln which supplied bricks to the town. This visit was very profitable and in a few days the children were keenly interested in brick making, and we had any number of bricks ready for the building. I would be straining your patience too much if I were to take you through different stages by which the wood work was prepared. But it would interest you to know how the different houses were designed. Small committees of boys were formed who visited houses of people of different professions, carefully examined them and in about 3 months a miniature village was ready.

Naturally you would ask what about their studies of the rest of the subjects. The interest in them was increased because the reading, writing, arithmetic, and nature study and even geography were developed with that village as centre.

Gentlemen, this is what I mean by manual occupation in the school. The different things constructed by children were not bad but could not in any sense of the word be called perfect. But we had laid the foundation for future activity ; and above all had driven out the contempt for manual labour which looms so large in the mental horizon of our educated classes.

HANDWORK IN SCHOOLS OF GENERAL EDUCATION.

BY LALA HARI RAM, B.A.,

Inspector of Drawing and Manual Training, Central Provinces.

Education in schools has changed its course from time to time and place to place. There was a time when it was purely of a literary type and was regarded as an accomplishment for the few. Now, however, it is of varied character and considered a necessity for every individual. Everywhere efforts are being made to make it as widely spread and as easily accessible as possible; and manual work of one kind or other has been added to the literary subjects. Facilities have been provided to train the hand and eye along with the head and mind and doing is taught side by side with learning.

Not long ago a beginning was made in this direction in our Province, by introducing Kindergarten occupations in Training Institutions and some of the Primary schools. Special teachers were appointed for them and a considerable interest displayed. The teaching of these occupations was in full swing and carried on with some success as long as the officers, who had taken an active part in their initiation, held the reins of the Department and directed its policy. With the arrival of their successors the interest began to wane and the occupations dwindle. This is not because of the absence of suitability and intrinsic value of the occupations but because of the lack of attention of the authorities and wavering policy of the Department. The suitability of these occupations has long been tried and their value fully established in almost all the leading countries of the world. But it is a pity that no attention is paid to develop them further in our Primary schools; rather they are left in a neglected condition to linger and to die.

What appeared a want of attention of the authorities in allowing the manual occupations to remain undeveloped in the Primary schools before, to a careful observer seems to be a mistake now. He finds that the introduction of Manual Training Middle schools is being vigorously pushed on without the least attention to stimulating the manual occupations. Manual Training in wood and metal is only development of the Kindergarten occupations and to introduce it in Middle schools without a necessary preliminary training in paper, card-board and clay modelling is a faulty procedure. It is a risky and costly course and success in it is very doubtful. The teaching of the lighter occupations in primary classes must be developed and that of manual training extended to the high classes to make it a complete course in manual

work. Manual training in the middle classes without its extension in the high and only a feeble basis in the primary classes is a work rudely begun and half done.

If for financial reasons or want of time it is not possible to improve the manual occupations in primary classes it would be advisable to drop them from the primary classes altogether and to substitute them for manual training in the lower middle. The pupils in these classes are not physically fit to derive much benefit from a bench work. A training in these occupations, preparatory to the bench work, would be of far greater value to them ; and they would be able to pick up the bench work in a much shorter time and do it more successfully, without comparatively much less waste of material in the upper classes. But the extension of manual training in high classes is an urgent necessity and should not be postponed any longer. It has already been over-delayed. A student at present, when he has just reconciled himself to manual labour, adjusted his hand to the use of a tool and awakened his mind to do something new, is to discontinue the work with no, or very little satisfaction with the smattering that he has acquired. It is a great drawback and its removal needs the earliest attention of the authorities.

Educational gain from hand-work is rather too distant and indistinct to be visible to a layman's eye, but its industrial gain is distinct and clear and can be at once seen by every individual. To make a practical use of this industrial gain it will be advisable to connect the schools of General Education with the Industrial Institutions, by arranging for the regular transfer, from the former to the latter, of such pupils as show a special aptitude for hand-work, and are either not likely to prosper in literary pursuits or not able to prosecute their studies in that direction any further. Provision of some scholarships for such pupils by the Government and private bodies will be an act of philanthropy and material help to the cause of industrial training. It will also minimise the trouble that is now experienced in the supply of skilled labour.

Natural fitness, self-exertion, and proper guidance are the three factors that are of vital importance for a success in any pursuit. Of these, fortunately for our Province, there is enough physical strength and good deal of diligence for manual work. What we lack is probably the expert guidance. As long as that is not available let us depend on practice alone, and acquire as much knowledge by personal experience as we can. Practice is the one secret of success in all attempts and it is particularly so in handwork. No perfection is possible without sufficient practice in manual work. It is practice that makes one perfect in it. We should give our pupils a constant and well-graded practice to the best of our ability, utilising every minute of the

time at our disposal. Long and frequent discourses a teacher of manual training must avoid. Doing can be taught by giving practical demonstration to the class and by making them do. Talking about doing helps but very little.

Absolute truth and mathematical exactness in manual work sound very well to the ear and appeal so strongly to the mind. But how far can this exactness be acquired during the short time at our disposal? Exactness depends upon one's control over the tools and that control is dependent upon care and practice. We should deprecate and discourage all careless work and insist upon continued practice. It is not wise to enforce exactness too rigidly in the elementary classes. Such an action is likely to cause a disappointment and distaste for the work among the pupils. Mathematical exactness in these classes is not quite practicable, if not altogether impossible. Attention to the proper use of the tools and also to the use of a proper tool in all operations is the one sure way to arrive at exactness.

Drawing is a useful and necessary link between General Education and manual work; and it is gratifying to see that it is sufficiently established in almost all the schools. Its teaching however calls for attention. In Mechanical Drawing no accurate production is possible without a very careful use of the scale and instruments. It is to the use of these instruments that the teacher should pay greater attention. Accuracy in projections calls for a power of imagination. To develop this power there must be a course of well-graded exercises. Early attempts in mechanical drawing should be to scale; the scale to vary as the pupils advance.

Our course in Art Drawing is much too formal and shows very little expression. It does not develop sufficiently one's power of free graphical expression, which is one of the fundamental aims of teaching drawing. There should be more of drawing from memory and imagination to fulfil this aim; and such drawings should be rapidly produced. In formal drawings attempted from nature or object much improvement can be effected if the teacher always keeps in mind that "Drawing is a record of one's observation or imagination and that observation must be correct and imagination strong before any truthful representation can be possible." It is the power of the pupil's eye to see and see correctly that he is to develop most. The pupil's power of expression will need no, or very little care of the teacher. An eye that can read a form correctly from an object would not be content with a faulty expression of it on paper; and will insist upon the hand to mend and remend it till it looks exactly like what it ought to be. The power of the hand to execute the form gracefully and quickly will be acquired only by practice.

Expressional Drawing is of primary importance to a pupil of pedagogy. A course in drawing for Training Institutions should be such as aims at developing free graphical expression of a pupil. In addition to drawing from nature and objects there must be landscape and action drawing, and also a good deal of drawing from memory. Exclusion of such studies from the syllabus is in no way justifiable. Insufficiency of time is no excuse for it. Experience has shown, in other Provinces, that all this can be done with a fair degree of success spending three periods a week for two academic sessions. What is needed for it is a different procedure and more intelligent teaching. We should proceed from whole to the parts, from general form to the details and from mass to the outline. For a teacher the power of free sketching is more useful than the power of producing a finished drawing in a comparatively much longer time. To make a drawing of some practical use to the pupils of Training Institutions, studies on paper must be short timed. They should be followed by quick drill exercises on the black-board. No matter, if the drawings produced are small and not detailed. A drawing 3 to 5 inches long representing a general form and character, and suitable to convey the idea to a reader may be considered quite enough.

Animal forms and human actions tried in mass give a vivid representation and are easy to produce. Such studies combined with drawing from objects are very interesting and useful, and are within the reach of an average pupil of a Normal School. They must be included in the syllabus.

Handwork in schools of general education needs an eye over it that can detect faults at a glance, and a hand that can readily show by practical demonstration the way to remove them. Supervision of a layman might succeed in exacting most work from the teacher, but it cannot remove his professional difficulties. The absence of a specialist Inspector makes one accuse the department of parsimony and shortsightedness. But one can in no way believe that it does not recognise that by far the most important duty of an Inspector is to guide the teacher in his work, rather than make a report about his good or bad points. The necessity of a specialist Inspector is being keenly felt by the teachers and the sooner one is appointed the better. Without a Specialist at the helm of this branch of Education the quality of work is sure to go down, though the quantity might increase.

HANDICRAFT IN THE SCHOOL.

BY LALA VITASTA PRASAD, B.A.,

Dyal Singh High School, Lahore.

When we study the scheme of studies followed in the schools of this province in the light of modern methods and developments obtaining in the West, we cannot help feeling ourselves deplorably behind the times. The school curriculum prescribed for each department is both ill-assorted and inefficient and there is so much overlapping of subjects in different classes that, instead of feeling interested, the school boy begins to lose his interest in them, for the simple reason that facts are presented to him in almost the same monotonous way in every class. What is all the more intolerable is that as the boy advances from the Primary to the Lower and Upper Middle classes, he is made to know more things about Africa, and the North and South Americas than about his own Province. No effort is made to effect co-ordination of the brain and handwork, and instead so much unnecessary strain is brought to bear on the brain of a boy that by the time he reaches the end of his school career, he begins to look like a moony and stupid boy, with no equipment for practical life. He will perhaps sleep on a rickety charpai for a month or will suffer his table to stand on three legs for months together, before he calls a joiner to make necessary repairs. He will be deprived of his share in the family cow's milk since he cannot himself make a wooden peg to which to tether the young calf. These are perhaps very great tasks for him ; he cannot, in most cases, kindle an open air fire without trying all the matches in a box. No wonder that with the existing kind of bookish equipment, to which we restrict ourselves, the boys who leave our schools should be so horribly clumsy and left-handed.

For some time past there has been a consensus of opinion as regards the unsuitability of the educational state of affairs in the province. The present system of education has only resulted in ever-increasing unemployment among the educated youth of country. The educationalists have declared that unless a complete overhauling of the present system is brought about, there is a danger of the school education falling into disfavour among the middle class people, to say nothing of artisans and agriculturists. These latter are sure to remonstrate strongly against a system of Education which may tend to create a sort of disgust in their children for the occupations of their parents.

Khan Bahadur Mian Sir Muhammad Shah was perfectly right in remarking only the other day before a representation

gathering of school-masters of the province, that "instead of aiming at more literacy, our school education ought to be vocational so that the son of an agriculturist may have instilled into him the love of agriculture even in early life and may become a better agriculturist than his father, and the younger members of an industrial family may become more efficient industrialists than the older generation. A system of education, which fails to equip our young men for their ancestral or other occupations in life, while at the same time changing their outlook, cannot but be a source of widespread discontent." To my mind also this is the only way of solving the problem of unemployment and the economic struggle which threatens to get keener and keener with time. A matriculate of the 2nd division goes from door to door in search of employment, and no office holds out any hopes of employment to him, while a blind boy from the Government Technical School for the Blind stands fair chances of earning from Re. 1 to 1-8-0 per day by canework, or basket-making. Every year about fifteen thousand matriculates are added to the number of adults who have completed their school education, and leaving aside less than two or three thousand who go in for the University Education not less than twelve thousand successful candidates and about half as many plucked students have to lead a life of forced rest every year. Add to these the produce of the University and think of the heavy odds which grow year by year to welter in the slough of despair.

From these observations it will appear that the inclusion of one or other kind of handicraft in the existing school education is a great desideratum and a great necessity. Not that the same handicraft will suit the requirements of the different parts of the provinces alike; they may differ according to the nature of the special arts and crafts of the locality. The boys of Hoshiarpur may feel interested in brass, copper, and ivory in-lay work, those of Jullundur and Ferozepore in painted lacquer work. Jampur and Pakpattan are remarkable for small boxes and toys, Rupar for clay models, Multan for enamelled goods, Lahore for brass and copper work, Amritsar, Delhi and Ludhiana for embroidery. There are certain places where durries and *kheses* of different designs are woven, and certain others, where block printing on satin and cotton is a great industry. And if according to the special industry of a place the school boy is made to learn something of it, this would enable him not only to get on in life as an artisan but also to start business in that industry with great success. Sialkot has for instance developed a great trade in steel trunks and sports material; and Qila Sobha Singh is noted for brass work. No man can thrive as a businessman in these industries unless he learns the A.B.C. of it in his school life. The reason is obvious. Unless a taste for a certain art is acquired in early years, all chances of a liking for that vocation are lost for ever.

From the detail given above, I should not be taken to mean that I am laying special stress on the need of vocational schools apart from the ordinary schools providing secular education. The scope of this paper is just to dwell upon the necessity of manual training of some sort or other side by side with the training of memory and other faculties of the mind. Drawing involves both a training of the eye and the hand, and the British schools consider it, with representation, construction and decoration work, an educational process as real as reading and writing ; and educational experts recommend it as a sure means of developing human character. But I regret to note that in Indian schools this subject is not given the 100th part of the attention it deserves. In my estimation Drawing should be made the ground-work for the teaching of physical science, geography, geometry, physiology and last, but not least, handicraft in schools.

Last year, I thought of making a sort of agitation in the press regarding the revision or the remodelling of the existing scheme of studies. At first I decided to ventilate my feelings through the *Punjab Educational Journal*, but on second thoughts I had to change my mind in favour of the " Education " of Allahabad, fearing the editor of the former might keep my note under the heap of articles, already pending publication, like clothes received from the laundry. In one of my notes I proposed to remedy the evil of the multiplicity of subjects by reducing the number of subjects to the following in the lower classes :—English, Arithmetic, a Vernacular, Drawing, and Manual Training. The English and Vernacular readers are to include besides stories and sketches a series of lessons on history, travel, civics, and Nature Study. Drawing might embody map drawing, elementary lessons in geometry, painting, stencilling and photography while handicraft or manual training should cover a very large ground, including besides the special art or craft of the place, a continuous course of practical work such as sand modelling, raffia work, wirework, clay modelling, toy making, weaving, mat plaiting, book binding and wood work. Drawing will include schoolroom decoration also. My plan of work in arithmetic is quite different from that obtaining in the existing curriculum. I am against the treatment of this subject by means of different labels such as square measure, profit and loss, stocks, and shares, time and work, trains and true and commercial discounts. I would have the whole thing reduced to the most direct ways of calculation and exercise the student in a kind of arithmetic that would enable him to calculate the price of things bought or sold. I should require my boy to apply his arithmetic to solving his difficulties in manual training. Here are some instances. We have a sleeper of wood of a certain length, breadth and thickness ; how many stools, tables, or chairs can be made out of it ? What would be the price of a table if the whole sleeper is worth so much ? What profit would you make, were you to sell each table at Rs. 4-8-0 ? How many pill boxes of a

certain capacity can be made out of a cardboard of a certain size ?

It is this arithmetic evolved out of calculations about things actually bought or sold that constitutes practical arithmetic.

Handicraft in schools is intended not only to give each student a sort of confidence regarding his settlement in life, but to furnish him with opportunities to exercise his imagination as well as reasoning. Take, for instance, any of the crafts, such as mat plaiting, clay modelling, or paper flower-making for purposes of decoration. In each case the boy will have a clear idea of the intended design. There are certain very easy ways of making simple toys with pins, pieces of rock, small lengths of wool, cardboard, coconut shells, which must strike the imagination of little children. From these small beginnings they may be led on to mat-plaiting, handkerchief folding, and paper folding, each of which is full of enjoyment for little boys. The kindergarten and Montessori systems of education make free use of these things, and how far different must the life of English children be from that of our schoolboys who have no pictures and coloured things to amuse them, and who are compelled from the very start to pay continuous attention for a comparatively long time as patient listeners to teachers. And yet who does not find these children using their own resourcefulness in making paper boats, paper kites, etc., all by themselves, unaided by the teachers ?

It will not be out of place, however, to strike a note of warning here. Great care will have to be lavished in drawing a graded syllabus for each class from the infant class upwards. In the eighth class the boy would be able to fit up electric wires, make electric bells, dry-celled batteries, any simple science apparatus, or silver plates of glass. Models of the Taj Mahal, the Jahangir Mausoleum, the Ravi Bridge, the Golden Temple, the Royal Mosque, or any place of worship will make very decent exhibits for the school museum. Instead of learning the relief of India, it would be much better if the boys were asked to represent it with mud and clay and fill in animal or vegetable products. One such effort is quite sufficient to fix each fact in their memory. Besides, this will give the boy occasion to have some thing to refer to, handle, turn upside down, and pick up information through direct observation, and will save him from depending on hearsay or from letting his thoughts wander away from the abominable books and desks and benches, on which he is made to sit and repeat one or two words or sentences learned or recite multiplication tables without understanding them, after his class monitor. Thus we can help our future generation to grow more scientifically and unrestrainedly than now, and by setting up a regular

workshop attached to the school, encourage them to try to stand on their own legs by dint of labour.

It remains for me now to mention a few things about the furniture and equipment of rooms for Manual Training. At first sight it might appear that the introduction of handicraft in schools would entail very heavy expenses, but on closer examination and scrutiny it will be evident that all our fears in this direction are pure moonshine. In these days when the use of dual desks is being discarded on all hands, we can very easily have them remodelled into flat tables for Manual Training, so as to furnish two decent rooms. The chief requirement of this kind of training is the teacher who may be imbued with a real desire to work for his boys. One or two pigeonholed almirahs, a dozen or two sets of tools such as vices, saws, jack-planes, chisels, wood, cardboard, are not very expensive things, and these even would not be needed in the beginning. Of course, we might require a trained hand for Manual Training for the Upper Middle classes, but for all primary schools we need neither tools nor experts. A course of week or so spent by the teachers of the Primary schools, supplemented by their previous knowledge of drawing and manual training acquired at the training institutions will fit them for work. The chief requirement is a careful allotment of work and well-defined suggestions for the right procedure. Besides the teacher's enthusiasm and capacity for work, much depends upon the place assigned and the importance attached to a certain subject in the scheme of studies. If manual training receive the same measure of attention as arithmetic or reading in the school, I am positively sanguine in my hopes of its getting very popular in schools. My scheme of studies for the Upper Middle classes embodies certain additions, which I call further developments of drawing but I have avoided their mention here since it was not called for in the paper. Manual training may enable the boys to use their hands and judgment in making articles of daily use and such as churning sticks, teapots, cases for pens and instruments, brackets, rat traps, baskets of wire, towel stands and pegs. This will indeed be a step in the right direction and the people of the Punjab will always cherish the memory of all persons who would help in the introduction of handicraft in schools.

VOCATIONAL TRAINING.

A PLEA TO REVISE OUR PRESENT CURRICULUM.

BY BAWA UDHAM SINGH, B.Sc., B. T.,

Headmaster, Khalsa High School, Lahore.

A charge is levelled against the system of education current both in schools and universities of the country in general, that it does not equip a man for life ; and that it does not provide any training after which a boy can enter life independently. The schools at best produce clerks ; and even that walk of life is overcrowded. The universities, no doubt, provide training in some higher professions, such as the medical, engineering and law. But " how many of the common people " ask the critics, " have the mental capacity and material resources to pursue the studies of these professions ? " ; and for the matter of that, these professions have also become so top-heavy that it takes a very very long time for a fresher to make any headway in his own line. In short, our education is not utilitarian in any sense, and may be called an accomplishment only. It is why that a large majority of our masses do not take to it willingly and whenever they are compelled to do so, as is being done under the Compulsory Primary Education Act, they, in a large number of cases, go the length of paying the penalty imposed, rather than send their children to school. They say it does not pay them.

All this is true ; how often you meet your old pupils, many of whom have managed to secure a degree of the university and how often you happen to ask them what they are doing at present. In ninety out of hundred cases, you receive the reply " sitting at home, sir, trying in police department or the railway " and so on and so forth ! Every sensible parent is perturbed as soon as his boy reaches the 10th class, as to what his boy should do after his examination. They come to you in large numbers for advice and guidance ; but you at best, suggest the University, the medical school or the commercial centre. This has, at least, been my experience during the last 16 years I have been headmaster. I could suggest no other vocation. A painful shiver then runs through your body and you are constrained to admit that you have wasted so much of the time of your pupils.

Is it not our duty, indeed a moral obligation, to find out, as has been done in Western countries, in what lies the food of nation in general and mould or revise our system to that end ? So far we have been much enamoured of the study of classics, pure sciences and higher mathematics, the so-called liberal arts, and our school curricula have largely been framed with that end in view as if University-for-all is our aim.

Time has come, when modern educators should realise as did Plato many centuries ago, that higher studies are for the chosen

few, that the majority of citizens are content with the lower walks and occupations, and that, therefore, ample provisions and wider opportunities to equip them for some vocation in life be placed within the easy reach of all by the state or society. In plain words, it is the business of the school to provide training not in only liberal arts, but in such arts and crafts side by side, which when pursued will train the hands of our children, as liberal studies do train their minds ; and enable them to make a decent living as soon as they leave school, and make them useful, productive and independent members of society, and not let them be a burden on it. as a vast majority of our boys are now for some time.

I mean that vocational crafts should find a place in the curriculum of our ordinary schools and not only in special schools such as they are at present. Special schools have also a function of their own ; to prepare teachers and masters of fine arts and to add beauty to the humdrum life of common workers. I value them as such, and would like to see more of them in the Province.

I have, so far, tried to show that the present school curriculum is the least suited to provide for any vocation for a large number of our school boys after a training of ten years and that they are left to the caprice of Dame Luck to find a berth for them that it is the duty of our educators to advise such curricula for our schools, whereby it will be possible for a boy or a girl to step into life after his school with some equipment for it and that vocational crafts should find a place in the curricula of our schools and not only in special ones, and that training in these crafts should be given side by side with liberal studies.

As regards the actual scheme, I may at the outset dispel an apprehension which might have crept in the minds of any one of the audience that what I propose would be an addition to the already heavy curriculum of our schools and that it will be so much more burden to our young lads. Nothing of the sort ; I rather propose to cut down the number of studies and consequently the time devoted to mental work, and add only one vocational craft to be learnt and practised during the time thus saved.

I may also add that I am not going to touch the Primary Schools, nor the lower Middle ones, but leave these departments, as they are at present. My vocational school will begin from the 7th class ; so that four years of actual work can be put in from the stage, when the child is old enough to do manual work.

The studies proposed, as you will see presently, will lead a boy to the university course as well as some will choose to do so. There will be nothing in the scheme which will take away from the school the charm of liberal studies, a misnomer for " Babuship " which it possesses in these days ; and will neither dub it as a school for artizans to scare away the sons of higher classes. On the other hand, it will place ample facilities within easy reach of boys of

the middle classes who wish to earn a living independently of service and be a source to help of the family as early as possible, after their M. & S. L. C. Examination.

The studies proposed are as follows :—

1. A vernacular (Urdu, Punjabee or Hindi) with History of India	..	6	periods a week.
2. English	..	10	„ „
3. Mathematics (Arith., Practical Geometry and Algebra)	..	6	„ „
4. Science and Geography	..	6	„ „
5. Drawing	..	3	„ „
Total		31	„ „

These will take 31 periods in all, leaving thus at least 17 regular school periods a week, to be devoted to any one of the following vocations :—

1. Agriculture (Practical work on the farm, leading up to staple crops or fruit culture).
2. Woodwork (practical work leading to cabinet making or carriage building).
3. Photography leading to Lithography and three colour process work.
4. Making of Paints, Oils and Soap.
5. Sign-boards and picture-Painting and Architectural Drawing.
6. Electro-plating and enamelling.
7. Commercial subjects such as Typewriting, Shorthand and Book-keeping.

I would not recommend a school to develop and organise more than two of these departments. One Government school in each district should have, at least, one of the vocations—according to the needs of the Ilqa. Fortunately for this purpose, there are private agencies already at work in the educational field in our Province, and so they should be asked to co-operate with one another as to organise all of these in towns like Lahore, Amritsar, Gujranwala and Sialkot ; so that there is not overlapping of departments and no waste of public funds and energy. The Government should come liberally to the help of those denominational and local bodies who readily come forward to materialise the scheme in the spirit of co-operation.

The initial cost of equipment of any one of these departments, on a rough calculation will be from four to eight thousand rupees. The buildings and farms would be extra.

As to the teachers two at least will be required in each branch with a few labourers or menials to assist.

The syllabuses of these vocational subjects can easily be drawn up, after consultation with experts and that is a matter of detail into which I need not go here.

If the scheme is given a fair trial by the department and others, I am confident, even the university will recognise some of the vocations as subjects for the M. and S.L.C. Examination and make a record of that on the certificates of the candidates, thus putting a hall mark on the person and add to his market value.

I will make only one final request to the Head of the Education Department and to you all here to kindly give your best consideration to the scheme roughly outlined in this paper and if found practicable, give it a chance : in doing so, you will be doing the greatest service to the Province and solve the much vexed problem of unemployment, a good deal.

THE TEACHING OF ENGLISH.

BY D. REYNELL, ESQ., M.A., B.C.L., I.E.S.,

Assistant Director of Public Instruction, Punjab.

My object in this article is not to cover the whole of so vast a subject as the teaching of English, but to deal with that part of it which is of most importance to us in the Punjab. We have first to consider, then, what is our object in teaching this subject. Is it to achieve an appreciation of English Literature, or is it to achieve such a knowledge of the language as is necessary for the needs of the practical administration or business man? Perhaps both, but for either of these purposes a knowledge of the living language is the first necessity. How is this to be attained? It seems obvious that it can only be attained if the teachers of the language have such a knowledge as they are endeavouring to impart. It was recently my fate to have to correct a number of examination answers in English which were the work of graduates, and these answers abundantly showed that the average bachelor of arts the class from which our more responsible teachers of English in schools are drawn, does not know English. Until this defect is remedied we cannot hope for satisfactory teaching of English in schools. There are two points at which the remedy might be applied. The first is during the intermediate course in the university. Failing this it must be during, and preferably at the beginning, of the course of training. The remedy will be an intensified course in the essentials of the English language.

What are these essentials? The first is a good vocabulary of simple, ordinary, pure English. We do not need materials for the sonorous periods and sweeping superlatives of a Macaulay so much as the means of expressing clearly the ideas with which we

ordinarily have to deal. For our purpose, therefore, it will be best to avoid all obscure, unusual or needlessly long words. And we should also avoid all slang.

The next essential is sound construction, and for this a good knowledge of elementary grammar is necessary. It is somewhat the fashion now to pour contempt upon grammar. The old way of teaching this as a separate subject and as a kind of jugglery, was undoubtedly misguided, but it is a profound mistake to neglect grammar altogether, or to suppose that it need not be taught scientifically. Had our teachers in the past succeeded in inculcating only a moderate knowledge of the principles underlying English construction, there would be fewer educated people who persistently write "would" where they should write "will," or commit other errors of the same kind.

Almost equally important is a knowledge of ordinary English idioms. And here a warning is necessary. By idioms I do not mean the unusual or infrequent, the far-fetched expression which may do very well on a single occasion, but which should, if possible, be rarely used, and in some cases never again. Students are only too prone to seize upon these, learn them by heart, and use them on every possible occasion. If possible, therefore, they should never be allowed to hear or read them until they have acquired something approaching a mastery of the language and its vocabulary. By "idiom" I mean the ordinary ways of saying ordinary things in English, where they are not strictly in accordance with the ordinary principles of grammar, or where they differ from the way of saying the same things in the vernacular of the student. I might mention a large number of common errors in English which are due to a lack of knowledge of such idioms, but it may suffice to refer to the use of the articles, the use of "on" for "at" and the use of "not" after "until" and "but" after "though".

One of the worst defects which has to be conquered is bad handwriting. It is true that a man who writes badly may speak very good English, and that much of our writing is now done by means of a typewriter, but writing still remains an important part of linguistic equipment, and no student whose writing is illegible or indistinct can properly be said to know English. On the other hand, a man may be able to write quite good English and yet be incapable of speaking it. His knowledge may be of great use to him, but it is still incomplete; we must aim therefore at inculcating a good pronunciation as part of our training in the language.

We have next to consider what should be the methods by which these essentials may best be secured. First of all, let us not be slaves to "directness." The conversational method is valuable, at the beginning, to almost exactly the same extent as the real atmosphere in which the language is naturally spoken

can be reproduced in the class-room. Where this atmosphere is wanting, an extensive vocabulary can best be acquired by letting the pupils read as much simple English as possible as soon as they are able to understand an ordinary simple sentence. There is a general tendency to "put the cart before the horse" by laying great emphasis on writing in the language to be acquired before the pupil has had sufficient opportunity of becoming familiar with its vocabulary or form of construction.

Another very common error is to make the pupil, during a reading lesson, devote his attention to memorising the matter rather than understanding the meaning. It is absurd to ask him, after a single reading, to repeat a story from memory. What is necessary is to ensure that he understands what he has read (a feat which is still beyond the power of many matriculates and even graduates), and for this purpose there is no harm in allowing him to read it again.

As I have already said, we should, during the school course, avoid the unusual, so far as possible, and we should also avoid slang. To these ends we must first make a very careful choice of books for reading, preferring those which are in ordinary straightforward English to those which are either elaborate in their diction, or filled with obscure and outlandish words, or filled with slang. It is not possible, of course, to avoid these things altogether but where they must occur the teacher should direct attention to them as things not to be used, except with very definite justification. And similarly the teacher should always take the greatest care to distinguish between written and colloquial English—the novel provides endless opportunities for this—and to make his pupils use them appropriately. We may then reasonably hope, especially if the books are studied with reference to the principles of grammar, that our pupils will eventually be able to use the language for the purpose for which it was invented, *viz.*, for the coherent expression of ideas.

The prevalence of bad handwriting is largely due to the almost complete disregard in schools of what I may call the mechanics of writing. Teachers spend much time in writing elaborate models on the board, and in explaining the shapes of the letters which any observant child should be able to see for himself, but few trouble to explain the correct way of holding the hand and the pen, or to point out that the position of the hand for writing English is quite different from that for writing Urdu. From this primary defect of method flow most of the faults in handwriting, notably the blind "e," the misplaced thickening of the stroke, and all the consequences of the convulsive clutching of the pen caused by the effort to write on the side instead of on the front of it.

As to pronunciation, no doubt the use of phonetics is the ideal method. But let us not neglect the training of the ear. A

child who has been taught to listen should have but little difficulty in reproducing the sounds which he has heard and probably more bad pronunciation results from the failure to listen to the sound which has to be imitated than from a lack of knowledge of the precise mechanical means of producing it.

Let us then concentrate our attention, for the present, upon fundamentals, and aim at a thorough knowledge of ordinary English. By the methods suggested in this article—by no means to the exclusion of others of a similar kind and with a similar aim—we may hope to equip our pupils with an instrument for the interchange of ideas rather than a weapon to be used in the endless struggle with examiners.

SOME COMMON MISTAKES IN ENGLISH COMMITTED BY INDIAN STUDENTS.

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The topic indicated against my name in the programme is "Common Mistakes in English." I cannot presume, however, to deal exhaustively with all such mistakes in a short paper, and should therefore like to confine my remarks and invite your attention to some only of the common mistakes that I have year in and year out been coming across in the written composition exercises of my students, and the answer papers of the candidates for the various departmental and university examinations. The substance of this paper has been delivered by me off and on, in the course of my lectures to classes of students, preparing for the S.A.V. and B.T. examinations, with results, I have reason to believe, gratifying to my pupils, so that it is with confidence, begotten of experience and success, that I offer a few observations.

Composition is the subject for which students, as a rule, show least aptitude. The general run of students are not only incapable of collecting ideas on a subject, by the exercise of a little independent reflection, but they cannot be depended upon to write easily, lucidly and correctly or grammatically, the ideas they succeed in collecting by an immense amount of labour and profitless reading—to say nothing of method and order in disposing their material of facts and ideas. And what is true of composition generally is, with stronger reason, true of composition in *English* by an Indian student of average intelligence and application. I don't mean to disparage or discourage an Indian student, for, as was remarked by a distinguished speaker in my old college days some 28 years back, the students are not a class of people, they are a race of people and are just about the same all the world over. What I mean to observe is simply this, that to obtain a smattering of, or a nodding acquaintance with,—

not to speak of mastery over—a foreign tongue is rather a tough job or at any rate not a soft one. There are undoubtedly exceptional cases of some remarkable students, (but they are few and far between) who without any conscious effort on their part do assimilate what they read once or twice, and idioms of a foreign tongue stick fast in their tenacious or retentive memory so as to become a part and parcel of their everyday working vocabulary. But I am speaking not of such among them as form the exception but the bulk of students who form the rule. And even men possessing extraordinary linguistic aptitudes are, for the matter of that, apt to err. To cite but one instance, I have just been reminded of the famous lexicographer, Kamus, a Persian, who having settled and lived in Arabia for no less than 40 years, during which time, passing himself off as an Arab he also formed a matrimonial alliance with an Arab lady, (and Arab women are known for their strong prejudices against marrying non-Arabs), compiled after the strenuous labours of a life-time, his great and monumental work—I mean his dictionary of the Arabian language—a dictionary which is admittedly the best book of its kind extant. This great man, whose memory has been eliciting tribute of admiration from men of all ages and climes who have been consulting his great work with no small profit, the master of Arabic, one night while preparing to retire for rest, revealed quite inadvertently though naturally, his foreign or Persian extraction by couching his request to his wife to extinguish the lamp in language—the language which had been the special subject of his study and of which he is justly reputed to be a thorough master—which no Arab born and bred in Arabia would ever use. He said to her, *Uqtulis-Siraji* (kill the lamp) for the Persian idiom (*chiragh ra bikush*) rushed to his mind spontaneously and he forgot that the genius of the Arabic language had never adopted this idiom and never sanctioned its usage. This simple mistake resulted in the dissolution of the marriage tie and all its attendant misery. Mistakes in idioms, however, are a commonplace with students and the incident in the life of Kamus above referred to, was merely a digression, for I should like to advert to these mistakes later, should I find time for so doing. Suffice it to say here, that every language has its own idiom and it is so called because it belongs specifically and exclusively to *one* language. It does not belong to any other, as a rule. It is, as it were, 'its own' as its literal meaning conveys (Gk. *idiom*—one's own) and "an idiot" or a congenital fool is so called probably because he is always taken up with or engrossed in his own ideas, indifferent to anything around him.

To resume the thread of my discourse. However difficult (for an average student mind) to turn out a creditable composition containing tolerable matter arranged in methodical order and in correct, terse, elegant language, all may, by study and practice, acquire sufficient skill in the art of expressing ideas in accurate and clear language to render a good account of themselves

' Nothing is denied to dogged pertinacity.' ' No rock so hard but that a little wave may beat admission in a thousand years.' A little undivided mind-giving, exercise of a little care and constant practice are bound to be attended with success. All teacher will do well to bear in mind that composition is nothing but written speech and if any man can, if he tries, learn how to swim, though man is not a swimming animal, with stronger reason, since man is a speaking animal, any man can, if he tries, pick up or learn how to write ' his thoughts, his wants and his observations.' 24

Now the two main things to be considered in every composition are firstly the *matter* and secondly the *manner* in which the matter is presented to the reader. Of these the former, *viz.*, the matter, which is the more valuable and in the case of original composition the more difficult to acquire, need not engage our attention for the purposes of this paper, for it is excluded from its scope. However, it stands to reason that materials can be gathered by (1) extensive reading, (2) close and careful observation, and (3) formation and cultivation of habits of independent thought. Ben Jonson says, " For a man to write well, there are required three necessities, to read the best authors, observe the best speakers and much exercise of his own style." L. Cope-Cornford observes, ' Ideas, vocabulary, choice of phrase, device of metaphor and simile, the whole equipment of a workman, these may be acquired by reading and reading alone.'

Assuming that the mind has been sufficiently enriched with ideas and the necessary material has been adequately collected, the student has to acquaint himself with the art of clothing these ideas in suitable language and of judiciously arranging them in a rational, correct and telling manner. In other words, his business or concern is to acquire grammatical accuracy and precision of diction. But it is here that he breaks down through his ignorance of the correct forms of language as it is written by standard authors, men of letters and education. He is liable to commit errors in sentence-making, errors of grammar, errors of construction and errors in punctuation and spelling. Now to consider these in order, one by one.

Errors of grammar consist of transgression of the rules of syntax. Some students, for example, do not observe the rule that the verb must agree with its subject in number and person and would write sentences of the type of " The horse as well as the cart *were* sold?" Others are tempted to use the pronoun " he " and its oblique cases for ' one ' and its oblique cases, *e. g.*, " It was so dark that one could not see *his* neighbour." Still others fail to use the same pronoun throughout, *e. g.*, " The little bird fluttered *its* wings twice and then *he* flew off to *its* nest." Or to give some two or three examples from the answer papers of the candidates of the Supplementary Intermediate Examination, 1926."

“Moses was compelled to *put off* his shoes, but at the place where they *carried their* shoes and we accompanied them, what to talk of you, even the great religious men fail to gain excess.” (This is the translation of the vernacular.)

بے شک جنابِ موسے کو جوتیاں اُتارنی پڑیں نہ جس منزل
تک وہ جوتیاں پہنے چلے گئے۔ اور جہاں تک میرا راز کا
ساتھ رہا۔ وہاں آپ تو کیا ہیں۔ بڑے بڑے بزرگانِ دین
کی بھی رسائی نہیں ہو سکتی +

or “It tries to catch the victim in his clause (in attempting a description of a sparrow-hawk hovering above and descending upon a bird) or “This pride was resented by it (the shoes) and she uttered out of his mouth” (While translating the vernacular

ٹپٹی ہوئی جھٹی نوں اُتار رہیا ساں کہ اوس نے زور دند
کڈھ وکھائے۔ تاں میں ایہڈا بچھٹا ہويا کہ وس نیں لاه
کے پرے سٹیا۔ میرا ایہہ ہتکار دا روسا اوں نوں اجوگ
جیبا لگا۔ اپنے مونہوں کن لگا۔ میرا دوس +

or while describing a dog chasing a rabbit. “No sooner it caught sight of the rabbit, . . . he ran.” A large proportion of students fail to mark nouns in the possessive case with an apostrophe (') or an apostrophe and s ('s). Double comparatives, double superlatives, double negatives and double . . . tives without end are but too often used. Auxiliaries 'have' and 'had' and the verb 'to be' are followed by the 'past tense' and not the 'past participle,' e. g., 'And now his companions have *forsook* Rana Sanga.' 'Much water was *drank* to-day.' 'Is' and 'was' are used for 'has' and 'had' e. g., 'when it is reached its full growth, it begins to decay.'

ERRORS IN CONSTRUCTION are undoubtedly errors in grammar also, though they may not transgress or violate any of the rules of syntax. These are due to three reasons:—

1. *Insufficiency of words*, e. g., the suppression of the predicate as in the sentence “I (was) wandering through the wood and gathering sweet violets; or I, wandering through the woods, gathering sweet violets, (was frightened by a fierce tiger).

2. *Superfluity of words* as in sentences in which both a noun and a pronoun or both or two pronouns are used as subjects of the same predicate particularly in such complex sentences as “A man who was carrying the load, *he* was the shepherd.” ‘He

gave out a loud cry which the shepherd could not hear *it*.
 "Tiger, the dog, who had served his master for five years, *his*
death was certain."

or "This man, who if he had worked hard *his success* was certain." Considerable rearrangement or an absolute recasting is necessary to amend such sentences. Instances of such stranded relatives can be multiplied. The easiest way of correcting such mistakes is not to make them. The students should beware of firstly, the omitted predicate, secondly, the superfluous pronoun or the second subject, and thirdly, of the stranded relative or the change of construction. They should bear in mind that if they write down a relative it must not be lost sight of until it has been provided with a case.

Again some students are used to inserting the particle 'for' before the infinitive with 'to' denoting purpose, *e. g.*, "I come for to obtain permission." They are also in the habit of using 'like' and 'without' as conjunctions, *e. g.*, "Never come late *like you* did the other day"; or I will not proceed further *without* (instead of *unless*) I make sure of my admission. Some other typical examples of superfluity of words are the following :—

"He is certainly the tallest man I have ever seen (before)."
 "We returned *back* home": "Sohrab received a *mortal* wound which caused his death." "I have never (*in all my life*) told an untruth." "The cause of outbreak of cholera in an epidemic form was (through) bad water and bad foodstuffs." "The reason of our delay was (owing to) the breakdown of the engine."
 "Jhelum has a population of 9,000 (inhabitants)."

The third great cause of the errors of construction is a faulty arrangement of words in a sentence. Students sometimes are liable to forget that English is not an inflected language and that therefore the relations of different words to one another in a sentence are not indicated by changes in their forms but by the order in which they are arranged. Take the case of a simple sentence like "Glory follows virtue." If the order of these words is changed the meaning of the sentence also undergoes a change or the sentence becomes meaningless, for it is their position that determines their relation to one another. The case with inflected languages is however different. This same sentence rendered into Latin would read as 'Gloria sequitur virtutem,' the suffixes of the first and third words indicating their relation to each other. So if this sentence were to be written in six different ways which by the laws of permutation and combination are possible, the meaning would always, *i. e.*, in all six cases, remain the same. The same is the case in Arabic.

Hence the importance in English of the proper arrangement of words. The chief mistakes however arise from misplacing (1) adjectives, (2) adverbs and (3) correlative words—mistakes,

which, to say the least of them, interfere with the clarity of the sentence.

1. As to adjectives they are not in some cases placed as near as possible to the nouns they qualify, *e. g.*, "Two brothers lived in a village named Mohan and Sohan" and "He carried the parcel to the Post Master tied up in brown paper." The Moor took up a bolster, full of rage and jealousy, and smothered Desdemona."

When two possessives are in apposition, the apostrophe is sometimes used with both (and not with the second only), *e. g.*, "Jan Nisar reached his master's Ibn-ul-Waqt's house."

2. As to adverbs the use of 'only' and 'even' needs special care, as a change in their position may quite alter the meaning. 'We may, for example, introduce '*only*' in various places in the sentence, 'Mahmud tried to count the big jewels,' with each time no small effect upon or change in their meanings, *e. g.*

"Only Mahmud tried to count the big jewels" would mean Mahmud alone and none else.

'Mahmud only tried to count the big jewels' would mean that he only tried to count but did not actually count them, or he tried nothing else.

"Mahmud tried only to count the big jewels" would mean that he tried simply to count them and nothing else.

"Mahmud tried to count only the big jewels" would mean that he tried to count the big jewels and not the small ones.

3. The chief correlatives ordinarily misplaced are 'both . . . and,' 'either . . . or,' 'not only . . . but also.'

Errors in punctuation. The omission or wrong use of commas or full stops may, apart from taxing the patience of the reader, make nonsense, *e. g.*, 'One morning in January King Charles was walking and talking half an hour after his head was off.' By the omission of a period after 'talking' the writer is attributing to the dead body of Charles the performance of an impossible feat.

I was telling one of my classes the other day the story of the comma that cost the United States of America £40,000. Among the commodities that were to be admitted duty free to the ports of the United States, according to their tariff regulations, was fruit-trees with a hyphen between fruit and trees. Through a little mistake on the part of a clerk or through a printer's devil the hyphen was omitted and a comma—which by the way literally means cutting—substituted with the result that fruit as well as trees of all descriptions were for one year admitted free from all duty in all the ports of the United States and the close of the year when the mistake was detected it was calculated that this very ordinary mistake was responsible for a loss of no less than

£40,000. And despite this students would either insert no commas at all or would be very lavish in their use, thus adding unnecessarily, enormously to the work of the teacher correcting their manuscript. Somehow or other a vast majority of them seem disinclined to insert marks of exclamation and interrogation and even periods. Of use of capital letters, in season and out of season and without any rhyme or reason, they appear to be particularly enamoured. They are also prone to exhibit a strange predilection for the use of abbreviations and contractions but would seldom take the trouble of indicating them by the proper periods, *e. g.*, *i. e.*, *viz.*, A. D., B. C., Col., M. A., B. T., Govt., etc., are all written in their contracted forms but the periods are oftener than not, if not invariably, absent or even scrupulously avoided. In some cases they do not know which full words of Anglo-Saxon or foreign origin they are indicating by the approved abbreviated forms they employ. Etc., for example, they think means other persons and not other things and they write 'I attended the meeting and found that Ram Sharan, Har Bhagwan, etc., were all present.' Sometimes they do supply these points, not immediately after the word at the end of a line where a pause is intended to be made but at the beginning of the following line. Similarly some students feel irresistibly tempted to divide words of one syllable or (mono-syllables) at the close of a line into two parts by a hyphen, *e. g.*, fri-end, ne-ed, or they divide words of more than one syllable (poly-syllabical expressions) not such as to have in the two lines between which they are to be divided, syllables beginning with a consonant, but as it pleases their fancy or suits their convenience, *e. g.*, atte-ntion, del-irium, etc. When two consonants come together, the division would seldom be made between them, *e. g.*, sy-lable, accomodate, etc. Inverted commas are either not used, (little thinking that the absence or misplacement of quotation marks forms a serious blot in written composition), or if used at all, they may be begun but no care is taken to close them. Day after day these so-called small things are brought to the student's notice but the worst of it is that they go in at one ear and out at the other. Students do not deem it worth their while to take in and observe these instructions but make it a point to consign them to oblivion or through force of habit persists in omitting or suppressing these points. It may be readily conceded that these important points are in themselves trivial things but they do contribute to perfection which, if foolish to expect and denied to mortals, should with every show of reason be made an approach to. Dr. Dunnicliff in his presidential address at the Science Section remarked that his experience of the written work of the students was a sad one, but believe me, mine has been sadder still, particularly in the case of the B. So.'s.

As to spelling mistakes, when I make an appeal to my past and present experience, the effect is not happier or more encouraging. The spelling in the case of a large proportion of students, to

put it simply, is disgraceful. Accommodate is spelt with one *m*, separate with *e* after *p*, beginning with one *m*, receive with *ie* after *c*, boundary with no *a* after *d*, until and cheerful with two *l*'s, intelligent and committee, with one *l* and one *t* respectively, imprison and village with *i*'s after *s* and *l* respectively. Again they write lose with two *o*'s, verified and servant with *an* after their first letters and so on and so forth. Nor is there any excuse for these mistakes, for the words given above do not present any very particular difficulty with respect to spelling. I mean to say that these words are not like those which may justly be called traps for the unwary. I refer to words with silent letters or words alike in sound but unlike in spelling and meaning, in spelling which, through careless confusion or otherwise, there is some danger of mistakes creeping in. Instances of the former are cleanse, dreamt, meadow, realm, breakfast, debt, doubt, scene, scissors, scythe, sigh, high, nigh, laugh, through, fought, foreign, gnaw, know, knife, knee, palm, calm, calf, half, etc. Instances of the latter, I mean the words alike in sound but unlike in spelling and meaning are : course, coarse ; core, corps ; colonel, kernal ; dew, due ; fore, four ; fair, fare ; heel, heal ; new, knew ; herd, heard ; rain, reign, rein ; throne, thrown ; rung, wrung. The *y* rule is another trap for the unwary. Students as a rule do not know where it is to be changed into *i* when adding, and where not, that they are to keep *y* if the affix begins with *i* (as *ing* or *ish* in carrying and babyish) and if it has a vowel before it (as chimneys, valleys, journeys, etc.); that there are a few exceptions to this, as for example, day, daily ; gay, gaily ; lay, laid ; pay, paid ; and that '*y*' is to be changed if it is preceded by a consonant, as in busy, daisy, enemy, fairy, merry, noisy, etc.

Another fruitful source of error is the insertion of particles of prepositions after nouns, adjectives and verbs. Nor are the Indian students much to blame ; for there are no hard and fast rules governing their insertion. There is no reason to assign why we agree *with* a person *to* a proposal, are angry *with* a boy *at* his conduct ; why one exults *over* a person *in* his misery ; is familiar *with* a thing but familiar *to* a person, why we say "horses feed *on* hay" when the verb is intransitive and "feed the horses *on* or *with* hay" when it is used transitively ; why we are grateful *to* a person, *for* a thing, why one is heir *of* a person but *to* a thing and why we are indignant *with* a person *at* a thing. Nor can we account for using looking *over* and looking *into* when a casual or a careful examination or inspection respectively are intended, for saying influence *over* or *with* a person, but *on* one's conduct or for saying taste *for* painting and taste *of* hardship.

The only reason we can adduce is that the genius of the English language so wills it. It sanctions the use of "*with*" after compare when like things, e. g., a cat and a tiger are to be

compared and of "to" when unlike things (e.g., Wellington's squares and solid walls have some points in common. It accords its sanction to the usage 'differ with' and 'differ from' when persons and things respectively are involved. Students again do not realise that synonyms in the English language are in meaning only similar but not quite the same and they are liable to use them interchangeably. To be able to use the language with precision and exactitude and to secure a singular fitness in the use of the words employed, they should be acquainted with their exact significance. The only satisfactory way of perceiving the nice and subtle shades of difference in their meaning is to observe the practice of correct writers.

Again the composition of a large proportion of our students very often consists of one long paragraph. If they divide it into paragraphs at all, they betray gross ignorance of paragraph structure. In the first place, they seldom indent them. The first word is not set in a little to the right or a little inward from the margin. Again the paragraphs, generally speaking, do not begin with topic sentences, or if so begun, the rest of the sentences in the same paragraph do not illustrate the topic sentence containing the main thought. They are, moreover, deficient in the art of paragraph weaving—the passage from one to the other is not easy and flowing and natural, but abrupt and jumpy. Care should be taken that they are arranged in some rational manner; logical or chronological as the case may be. They should not be thrown higgledy-piggledy like a cart-load of rubbish shot on the ground. The importance of coming to the point at once, without any circumlocution or beating about the bush cannot be overrated nor that of ending answers or composition in a telling manner, for students are the greatest delinquents in this respect. Their introductions are, in nine cases out of every ten, a trifle too long and even calculated to exhaust one's patience and to bore one, while their conclusions "hang fire and drag on into meaningless platitudes." Their composition should open plainly and end sharply and dramatically without any waste of words.

Further students must be made to observe the laws of relevancy and to develop a sense of proportion. *Relevancy* demands that everything extraneous to the subject or not directly bearing on it should be ruthlessly excluded. In a composition on the description of a dog rounding up a flock of sheep it would be utterly out of place to launch forth into a detailed description of the mammalia or the canine species of the country side, just as a peepal or a banyan tree would be monstrous in a picture of a shipwreck. Let it be understood by students once for all, that if they pad their answers with irrelevant matter, so far from adding to their value they detract from it. Addition to weight means but a reduction of value. Let their minds be disabused of the erroneous idea that the worth of an answer is estimated by its

quantity rather than by its quality. A good short answer gains more marks than a feeble long one. *Proportion* demands that the points or items of the answer should be treated at such length as is due to their relative importance. In a composition on "A driver on a country road" a candidate devoted a page and a half of his answer book to describe how he got to the road, and the drive on it—the essence of the essay was dismissed in hardly three or four lines. This was an apt illustration of an outrageous violation of the laws of proportion. No time, therefore, should be lost in teaching students how to apportion time and energy to the different questions and parts thereof.

So the following four points or laws of composition should be impressed on their minds:—

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|--|----------------------------|
| 1. Events or ideas should be told or given in the order in which they occur. | The Law of Order of Time. |
| 2. Each idea should be presented clearly and tersely so as to evoke attention. | The Law of Interest. |
| 3. Each event or idea should grow out of the one preceding | The Laws of Growth. |
| 4. Tense must not be changed in the course of the composition. | The Law of Unity of Tense. |

Many of our students are guilty of the breach of the last rule. They shift incongruously from past to present and *vice versa* and false sequences are but too often noticeable in their exercises.

Some students display fondness for ponderous, stilted and pedantic diction.

Their style should be simple rather than pompous, natural rather than artificial. High sounding words ending in 'osity' and 'ation' should be avoided. It should be borne in mind that simple, short and homely Anglo-Saxon words form the backbone of the English language. Florid and ornate style as well as rhetoric and fine writing should be shunned like poison. Sentences like "the domicile where this sentient being was first imported from the realms of invisibility into regions of visibility is in a blaze of conflagration," "the birds of the dawn, the harbingers of the morning brought the news of the riding of the Sun God, Hyperion on his chariot" and "The wind of conversation turned in another direction" are not half so forcible as "my home is on fire," "the birds proclaimed the rising of the Sun," and "conversation turned on a new topic."

Let the students understand the question, and, before attempting to answer it, see carefully what is demanded of them. If the question happens to be a controversial one, it is advisable to mention the view of those with whom they disagree—

mention them calmly, discuss them judiciously without passion or vulgarity and express their own views without dogmatism or vehemence. They must studiously avoid one-sided answers. Their attitude should be that of a judge rather than that of a lawyer. They should abstain from party pleading, discussing arguments *pro* and *con*, weighing them in impartial scales and then summing the whole question up judiciously and dispassionately.

In conclusion the students are advised that—

(1) they should not use profusely *and*, *but*, *while* and *whereas*. They should try to shake themselves free of and unlearn the prattling style, so common among them, of which the marks are jerky and broken sentences introduced by 'and', 'and also', 'then again,' 'etc., etc. :'

(2) they should not indicate the word 'and' by the symbol but write it in full ;

(3) their style should be natural, clear and easy, smooth and lucid, and grammatical ;

(4) before putting their pen to paper, they should think out every sentence in their mind ;

(5) they should not pick their words as they go on but choose their wording before they begin to commit anything to writing ;

(6) they should not repeat words unnecessarily, but should not hesitate to repeat them if repetition is needed to make the meaning clear. Compare these lines from Tennyson's *Lancelot and Elaine*, " Full often *lost* in *fanoy* *lost* his way. "

I know not if I know what true love is ;

But if I know then if I love not him ;

I know there is none else whom I can love.

(four ' knows ' three ' if's ' and three ' love's ')

What is true of poetry may, if necessary, be true of the prose at times.

(7) they should avoid slipshod and slovenly ways of writing. Bold, deliberate and neat handwriting is a valuable asset in the examination hall ;

(8) they should never use words of the meanings of which they are not perfectly sure or Malapropisms will appear in their composition, (e.g., revellers for rebels, pulse for purse, creed for breed " the dog was of good St. Hubert creed," instant for incident, persuaded for pursued) ;

(9) before words beginning with the sound of *You*, *we* use *a* and not *an* ;

(10) they say ' Ram is older than Sham ' but ' Ram is the elder of the two,' *i.e.*, that order is used with the verb predicatively and elder before the noun attributively ;

(11) it is incorrect to place Demonstratives *the, this, that*, next or to before possessive pronouns, *my, your*, and *his* ;

(12) they should learn to use both periodic and loose sentences in their compositions or they will grow very dull and monotonous ;

(13) they should not use too many quotations, for they serve but to betray their weakness ;

(14) they should avoid colloquialisms and slang ;

(15) they should not forget to revise what they have written, to insert proper punctuation marks, supply omissions and make necessary corrections ;

(16) they should see, when paraphrasing, they do not murder the passage to be paraphrased.

SPOKEN ENGLISH.

BY MR. H. C. KATHPALIA, M.A.,

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The constant use of the English language by the educated community in this country is inevitable. Most of us cannot earn our living if we do not know enough English to express ourselves both in writing and speech. For this chief reason, and for several others which I need not stop here to consider, the study of the English language is obligatory in a vast majority of our schools and colleges. Leaving aside the ambitious students who may have higher aims, the aim of the average Indian student in studying English is to attain a ' sufficiently correct ' working knowledge of the English language, written and spoken. Why I have used the words ' sufficiently correct ' and what I mean by ' correct ' particularly, I shall explain presently.

I propose briefly to discuss in this paper how far an average Indian student of English succeeds in the attainment of his aim under the present conditions of the Teaching of the English Language in our schools and colleges. I would request you kindly to remember that I am considering the English *Language* and not Literature and I am one of those who contend that it is impossible to *fully* appreciate (the split infinitive here is necessary) the Literature in a language unless you can speak that language extremely well.

You will agree with me that the best person to judge whether or not I speak a language correctly is the person who speaks that language as his mother-tongue. When a foreigner speaks Punjab;

badly, it jars on my ears and except for fun, I do not like him to continue using my language incorrectly within my hearing. It gives me nausea. I believe it is the same with the Englishman. If I speak to him in incorrect English, it gets on his nerves. He suffers to hear me out because he cannot help it. English is not our mother-tongue and it is vain to expect us to speak the English language with a perfection which belongs only to the Englishman.

Before I go on I would like to give you my definition of 'Language.' It is very primitive and therefore shocking. But it will do for the purpose of this paper. "Language is noise." It is intelligible noise made according to certain rules and regulations (you will excuse me the use of these clerical terms) and if we succeed in observing these rules and regulations, in speaking a language we are said to speak that language well.

All I wish to suggest in this paper is that it is possible for us to attain a sufficiently high standard in the use of spoken English. You seldom hear an Englishman compliment an Indian on his spoken English in spite of his holding the highest degrees of the best universities in the world. The reason is that the Indian student does not bother himself with the pronunciation, the intonation, and the rhythm of English speech. He is satisfied if he can put his words together in a grammatically complete and correct sentence and can utter it with sufficient speed.

At the present moment I am not concerned with his grammar. Perhaps an average Indian graduate succeeds in avoiding the worst grammatical errors, particularly those that are covered by the set rules of grammar which he has learnt at school with the greatest labour. But if I speak English without making a grammatical mistake, it does not follow that I speak correct English. I may write it fairly correctly, if my spelling and grammar are good. Speaking involves a good deal more. If I can make this point clear in this paper and succeed in provoking your attention and interest in spoken English, I should consider myself amply rewarded. You have probably heard a considerable number of non-Punjabis (Indians) and possibly some Englishmen speak the Punjabi language. How many of them, would you say, speak Punjabi correctly—not only well but *correctly*? Would you be prepared to give them credit for correct speech if they do not make a single grammatical mistake but mispronounce all the words and mismanage the intonation and the rhythm of your language? What is it that we expect of a foreigner before we praise him for his Punjabi? We want him to speak as much like us as possible. This shows that our criterion of 'correct spoken Punjabi' is not only the correct use of the Punjabi grammar, but the correct production of the Punjabi sounds, their correct articulation and intonation. Until our friend the

non-Punjabi attains a sufficiently accurate use of these, we are loth to admit that he speaks Punjabi correctly.

If we apply this test to the English that an average Indian graduate speaks to-day, it is easy to see that he does not satisfy even the most modest demands of the Englishman in this direction. He has learnt English for over ten years and at least, for the last four, he has had a great many occasions for verbal practice in it. Why is it then that he cannot speak English sufficiently well to satisfy the ears of an Englishman? The reason is not far to seek. He has probably throughout his career read with teachers whose own pronunciation was bad and who never bothered to improve it. Perhaps it is not the fault of the teacher either, for he met a similar treatment from his teacher. So that the canker may be traced to the man who first taught English in this country. It is a pity that sufficient importance has never been attached to a scientific cultivation of spoken English at our schools and colleges and teachers qualified for this work are not available. A beginning, however, has been made and it is hoped, that in the fulness of time, it will bear fruit and compel appreciation.

I have said above that we are unwilling to concede correctness to a non-Punjabi until he is able correctly to produce, articulate and intonate all the Punjabi sounds. The Englishman expects the same from us and, indeed, it is impossible to speak any language correctly unless you know all the sounds of which it is composed. Precisely as a foreigner attempting to speak Punjabi substitutes for the Punjabi sounds which he wishes to make, the nearest sounds in his own language, so do we unconsciously substitute those sounds of our own language which are most similar to the English sounds. This is obviously due to ignorance of the English sounds, mishearing and old habit. A student who has had the fortune of reading with English teachers or coming in contact with Englishmen in other ways, has a better pronunciation than his less fortunate brother who has had no such opportunities. This is apparently due to unconscious imitation and not to deliberate effort or study. If it were possible to put every Indian pupil under the care of an English teacher from the very start, he would, without doubt, begin to speak English perfectly. In fact I have heard Dr. Whitehouse suggesting the possibility of appointing English women to teach English to Indian boys and girls all over the Province. This, however, as he says, seems impracticable for many reasons. We shall have to depend on the Indian teacher and it is he who must make up his mind to qualify.

It is necessary then to know all its sounds before you can speak a language correctly. Everything else—pronunciation, articulation, intonation, in short the desired conversational power—

comes later. There are only two ways of learning the sounds,

- (1) naturally like the native speaker,
- (2) by deliberate effort, study and practice.

It is clear that the Indian student has only the sound method open to him. He must study the sounds and constantly practise their production till he can pronounce automatically. Once he has got the sounds correctly, pronunciation, articulation and intonation will not offer him any serious difficulties provided he keeps his ears open and gets proper guidance.

May I stop here to give you all the English sounds? They are 46 in number—21 vowel sounds and 25 consonant sounds. (Refer to any book on Phonetics.)

Let me now take a few examples to show how we substitute our own sounds for English sounds. I shall take the easy ones first.

Take the words 'will' (wil) and 'think.'

Why is it that we say ڀ for w and ٿ for θ (or the)?

These English sounds are not very difficult to pronounce. The reason is because the Urdu sounds ڀ and ٿ seem to us phonically so similar to the parallel English sounds that we unconsciously put them in without realizing that they are wrong and even if some of us do realize that they are wrong, we follow the path of the least resistance or do not know how to avoid the error for the very good reasons that nobody tells us and that the sound does not exist in our own language. You will notice that the examples of sounds taken above are all consonants. I shall now take a few vowels to illustrate the differences further. I shall first take a few words and then go on to a sentence to show how essential it is to get correct articulation and intonation to express your meaning.

Let us consider the most commonly mispronounced vowel, the final sound in the word "Law". Times without number would you hear everybody in Lahore—and Lahore is said to possess a better pronunciation than the mofussil, saying "I was going to the Law College as آئی دہانہ گورنمنٹ ٹیچنگ کالج" This will be

my typical sentence for illustration. I shall consider the sentence as a whole a little later. Let us first take the word "Law", you will hear 99% of us say la : instead of l ڀ : i. e., to say a : instead of ڀ : the reason being the same as given above. a : is a sound that exists in our own language whereas ڀ : does not, and the process of substitution is unconscious and easy. We don't know the sounds in isolation and in repeating what we hear an Englishman say, we simply use our own sounds.

You can take any number of words and you will find that most of our pronunciations are naturally based on what I have called the "Substitution Method."

I might give you a bit of news here. The Englishman—I wonder if he knows it—uses two *ls* 'little, milk' and seldom uses the lengthy 'i' at the end of a word *e. g.*, "Frivolities" is pronounced as 'frivolitiz' and not 'frivoliti : z.'

Let us now go back to our sentence, "I was going to the Law College." I have already indicated by imitation how an average Indian student speaks this sentence.

I—was—going—to—the—Law—College. (Refer to Urdu sentence above).

We can settle once for all the pronunciation of the definite article. It has been conclusively observed that the educated Englishman pronounces this word, without being conscious of it, as *thi* before a vowel and *the* before a consonant, except when emphasizing.

I shall now attempt to speak the two sentences in the two styles, I vaz going tu thi la; kalidz.
and Ai woz going tu the l : kolidz

Perhaps some of you will name the difference between these two utterances as a difference in fluency. This is not so.

آئی ہوں جا رہا ہوں تو لاء کالج

is fluent but it is not English.

In spoken English in its ordinary meaning this sentence consists only of five units. I was—going—to the —Law—College. You can call them five 'words' if you like. So that this sentence consists of seven words in written only five in spoken language. The pronunciation of many words when spoken in this sentence is different from their pronunciation when spoken in isolation. This is a very important fact to remember in English. Its ignorance or misapplication divests spoken English all of its beauty and very often its meaning. This is a fault of which the foreigner in general and the Punjabi in particular is guilty. There is a reason for it. The pronunciation of a word in our mother tongue remains the same in isolation and in a sentence. We do not slur over words which is necessary when speaking English, with the result that we speak English in jerks and are legitimately accused of 'staccato.' We know unconsciously that unlike our language words in spoken English hang together, and when trying to speak English fluently we introduce between different words what is called the glottal stop and our words fall on the English ear as so many different bricks falling from a height.

I should like here to repeat the warning given by the President of the English section in his presidential address that speed must not be mistaken for fluency. I have often in my classes,

given the example of two rivers—one very fast and the other very slow—but both fluent, and I have no doubt that all of you have met Englishmen who speak fast and slowly but you can't say that the last are not fluent.

I wish to refer to one more point in this connection that might interest you. It has been proved experimentally that an average Indian speaks English faster than an average Englishman. Most of you, I imagine, will take this statement with a grain of salt. I shall tell you what I mean. An Englishman and an Indian who spoke English at moderate speed were asked to speak the same sentence into a sensitive apparatus which recorded in the form of a graph, the number of sounds omitted by both. Both took the same time but the graph produced by the Indian was longer than that produced by the Englishman indicating that the Indian had uttered more sounds than the Englishman in a given period of time. In uttering this sentence he had introduced into it a number of extraneous sounds of his own language.

In English, as in all languages, it is impossible to make your meaning clear without stressing the most important word in the sentence round which the meaning centres. If we liken an English sentence to a cell, the most important word in it will be called the 'nucleus' of the sentence. You do not indicate such stress in writing. It is only when you speak out the written sentence that the meaning becomes clear. Writing is merely a symbolical representation of language. It is not a representation of what you mean to say.

For illustration we will draw on our typical sentence again. "I went to the Law College." It remains dead until I speak it out, otherwise you never know whether I went to the Law College or I *went* to the Law College or I went to the *Law* College and so on. Stressing the right words then is another important thing in expressing our meaning. We Indians are very often guilty of stressing the wrong word both in conversation and reading. One of the most striking mistakes in stress that you will hear from practically all Indians, whatever their education, is in the phrase "as well as." Everybody says "'As well' as" which it never is. Variation of sounds and stress infuse life into a language which may legitimately be defined as "Sound and Fury signifying a good deal."

I shall now consider 'Usage and Idiom,' in the English language. We have often been told by our English professors that we do not speak or write idiomatic English. What is idiomatic English? The best definition of an idiomatic style is that it consists in using the right word and no other. It means accuracy in the use of words and phrases as well as in syntax. Why an Englishman uses a particular word in a particular place is not open to argument. Let us take a few examples 'He was

taken napping'. There is nothing wrong about it grammatically and the meaning is clear. Yet it is unidiomatic and therefore wrong. We never say 'he was *taken napping*,' we say he was *caught napping*. "Things like this have much delight." Quite right grammatically but you will never hear an Englishman using the word "much" in this context. He will always say "things like this have their delight." 'I jumped over the wall of the compound.' 'Over the wall of the compound' is a very common mistake. The Englishman speaks and writes "Compound wall." There is no reason for it. That is the usage and must be accepted. Many examples will occur readily to you. It is true of every language.

Sometimes mistakes in idiom produce a comic effect. A notice outside a hospital in Cologne intended to indicate its catholicity runs thus, "This hospital *has no respect* for religion and *harbours* all kinds of diseases." And the title of a book recently published was "Profane and Religious Poems" whereas what the author probably meant was 'Profane and Sacred Poems' or "Secular and Religious Poems"

Perhaps some of you will ask me "how to cultivate the right usage and idiom". My answer is "I don't know" and my claim is that nobody does. In my opinion the only person to be relied on in this matter is the Englishman who lives in England. I remember my revered teacher, Mr. Langhorne, once telling me that Englishmen themselves after a long stay in India unconsciously learn to use Indian idioms and get their legs pulled by their people and friends when they go back home. I cannot imagine the most learned scholar of the Punjabi language making no mistakes in usage and idiom when he speaks or writes Punjabi. But with sufficient care and practice I think we can get very near our goal of speaking and writing a foreign language fairly correctly.

I have left out many interesting things. They are a matter of detail. I have tried to make this paper as suggestive as I could. A lecture on the science or better still the 'art' of spoken English is like a lecture on swimming or riding a bicycle. So that it is not much use. It is a practical subject and must be attempted practically. Perhaps some of you feel that the subject I have discussed is much too trifling to deserve so much notice. India has done without it for over a century and we can always do without it. I do not say you cannot. But you cannot deny that we do not speak English well.

English is the second language of several million people. In many parts of the world it is the language of trade. It is especially useful to us in this country. Whether or not it is worth our while to speak it well, is a question that I leave you to answer. I think it is, and I am convinced that we can with patient practice, which will not take very long, succeed in reaching

very near the goal. It is not a gigantic task. The spoken vocabulary of an average Indian graduate does not exceed 400 words. If we make up our minds to practise one word a day we shall have broken the back of the task in a year. I think it is worth our while doing so. So far I have not used the word "Phonetics" in this paper but if you have discovered that my paper is no more than an earnest and sustained plea for the introduction of Phonetics in our curriculum, I make no apology.

THE TEACHING OF ENGLISH POETRY.

BY M. UGRA SEN, M.A.

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I.

Talking of the average man's distaste for poetry, Arnold Bennett says, "There is a word, 'a name of fear,' which rouses terror in the heart of the vast majority of the English-speaking race. The most valiant will fly at the mere utterance of that word. The most broad-minded will put their backs up against it. The most rash will not dare to affront it. I myself have seen it empty buildings that were full; and I know it will scatter a crowd more quickly than a hose-pipe, hornets or the rumour of plague. Even to murmur it is to incur solitude, probably disdain, and possibly starvation, as historical examples show. That word is "poetry"

Now that may or may not be a true representation of what a normal cultivated Englishman feels towards this most sacred of the Muses. But in our own case, anyhow, there is not much love lost between the frantic poet hidden in a cloud of dreams and the crowds who go about the streets of this Eastern World: busy, noisy and respectable. A poet has always been somewhat of an 'Inscrutable' in the eyes of the common people—A 'deep fellow,' with eyes lined within whom they could neither understand nor wholly escape. And the fear and the wonder of his voice grow vaster when he sings, not in the mother-tongue of his hearers, but through the strange and half-understood medium of a foreign language.

If, as Mr. Bennett says, Poetry is a name of fear, the effort to teach it could be nothing less than an anathema. And yet poetry has to be taught and communicated by men and women who are not themselves poets, to audiences, not of the few-and-fit kind, but to boys and girls in whom the spirit, though young, is yet unvisited by the impassioned discoveries of the poets. But that should not disappoint us, for the young mind, not yet dulled in the benumbing round of life, is found plastic under the stress of the beauty of sound and colour. It is, to adopt the language of the scriptures, easier for a camel to pass through the eye of

a needle than for the fretful and fevered old money-changers of this world to value poetry.

But the problem of teaching poetry is a two-fold one. It is not enough to find the boys willing to learn. Of course they could not, even if they would, scatter, and empty their benches. Nor would they put their backs against you. But I would certainly allow them the right to protest and offer resistance, by all peaceful methods against the prosaic, colourless and soul-killing lectures of a badly equipped teacher.

A teacher of poetry must in the first place be (I would not say a master) a keen and zealous student of his subject. Without a thoroughly competent knowledge of English, and what is better, a yearning love for its beautiful forms, meanings and sounds, not much could be achieved. It is as material is to the potter, while his aesthetic appreciation and philosophical insight provide the skill which, driven by the motive power, of his enthusiasm, and his 'intellectual wanderlust' would create gods out of the raw and romping young people that flock to our schools and colleges. But the hungry sheep look up and are not fed. It is the teachers and not the taught on whom lies the burden of devising ways and means of making English Poetry both vital and interesting.

In addition to a complete acquaintance with the English language the teacher of Poetry should be well-informed about the sources and background of the English civilization as it has evolved through the ages. The literature of a people is the mirror of their innermost thoughts and feelings, a sublimated record of their laughter and tears, and a lasting enshrinement of their history. The roots of English Poetry lie in the English soil as well as in the influences received from the various currents of European thought: the Greek and Roman Classics, the French and Italian Romances, the German philosophy, the turbid waters of the French Revolution, the Romantic Revival and Industrialism, and lastly the bold and challenging curiosity of Modern Science.

A teacher who has not an intelligent grasp of these rich and changing experiences of the English mind is insufficiently equipped to interpret the spirit of English Poetry.

Then there is the question of sounds of the English language. Of this the less said the better. The phonetic equipment of the Indian teacher is so poor and so utterly misguided that nothing but a mortal crusade against it will make an impression. Thanks to the brimming zeal and tireless efforts of Mr. Firth, whose radiant personality is to-day absent from our midst, a beginning has already been made and a phonetic conscience if, nothing more, has been diffused in the minds of teachers all over the province. In Poetry, far more than in Prose, sound makes or mars the beauty of thought and sentiment. It is, as it were, the outer body of which the soul is the inner meaning of words. For a poet, as

for a lover. "Beauty stands for the united body and soul, united so completely that as Rossetti sings :

"Thy soul I know not from thy body, nor,
Thee from myself, neither our love from God."

A teacher who ignores the study of sounds, or what is worse, speaks them wrong crucifies beauty on the altar of his ignorance.

The knowledge of sounds is bound up with another—the knowledge of English metre. So far as I know there is no demand made in any of the University Examination for an acquaintance with English metre on the part of students. And if I remember aright, I passed through the whole of my student career without being told anything about this important element in the study of Poetry. "Why should we study metre and the other formal attributes of poetry? Because just as Michel Angelo studied anatomy as preliminary to sculpture, so we shall gain much insight into poetry if we know how poetry is made. Examining the lyric of Shelley is not like pulling a butterfly to pieces, because we do not harm it in the least: we do not even blunt our own susceptibilities if we are careful to remember that we are dealing with the material out of which poetry is made and the craft of the maker.

The poet is the maker, the inspired craftsman, in verse. His thoughts can be expressed in prose but it is the fire and force born out of metrical restraint (like the two banks to a river) which make them pulsate with life. It is the harmony of music which dresses his ideas in beauty. Writers of 'vers libre' and other such experimenters in Art have a notion—a very false one—that poets can do without metre. But one would like to refute them not on aesthetic but psychological grounds. Poetry is born out of a spiritual or emotional crisis in the soul and, as we all know, such a state of the mind whether sad or gay, has a sort of intoxication which expresses itself in music, dance and rhythmic movements of the voice and body. Half the charm of poetry lies in the proper recognition of these formal elements of grace and rhythm.

A teacher, if he is a true lover of poetry, will take pains to lend his ear to the swing, the harmony, the lilt, the melody and the stirring eloquence of the various forms of English verse. He need not teach all the intricacies and subtleties of the verse-forms to his students but the keen enjoyment he himself receives from such a study is sure to fill his discourses with enthusiasm—that mysterious force which makes all the difference between the good teacher and a bad one.

But what is this 'enthusiasm'? The Greeks understood it as the 'inspiration of the spirit.' It is not born of mere book-learning. In a very large measure enthusiasm is the result of

our outlook on life. It is the joy one finds in the liveableness of life : the capacity to take up tasks and to do them well. But, most of all, a person possessed of enthusiasm in the sense that the Greeks understood it, is endowed with the gift of seeing into the heart of things, of realizing the universal relationships of life, of seeking beauty and finding it in the things of life and nature. Such a person would be a poet and only poets have the right to stand as teachers, and interpreters between the creatures of beauty and ordinary men. Tennyson used to say that poets are born as well as made. So there is hope. Let the teachers go out to meet life : steadily and face to face ; let them feed themselves on the terrible loveliness of nature and learn enthusiasm. Their voice will then acquire a simplicity and a power which will not only relieve the tedium of teaching but may incidentally pour the seeds of future promise into the hearts of many an impressionable youth.

These then, are some of the virtues which a teacher of poetry, who loves his calling, should possess and cultivate : mastery of the English tongue, knowledge of the main facts concerning the making of the Western mind, a training in the correct pronunciation of English sounds, an appreciative ear for the rhythmic movements and the harmonies of the English verse, a study of the verse forms and, above all, an enthusiasm born out of a close and living contact with life, nature, and the facts of spiritual experience.

II.

So much about the teacher and his intellectual and aesthetic training. But unless he possess a knowledge of his class as well as good sense and good taste his enthusiasm and scholarship might do more harm than good. He must catch his class at a time when they are fresh in mind and body. A lecture delivered at the fag end of the day would fall on tired spirits.

At the very outset the teacher should give the students some informal talks on the origin and meaning of poetry ; on poets and their material consisting of words, thoughts, and images ; on the life and heritage of poetry which is as old as the story of mankind and yet as young as the delight of love. Of course, there is always a right way of doing things and a wrong one. The right methods of teaching always aim at presenting facts, however abstruse and difficult, so as to make them near and easy of understanding. I do not think it is difficult to talk on such a subject as the meaning and making of poetry even to very young students, and yet be understood and appreciated. Poetry is, when all is said and done, nothing else but the making of beautiful things out of the seeming chaos and ugliness of the objective world. Poetry concerns itself with the imagination and gives concrete shapes of beauty to its restless flights. It is the privilege of youth and childhood to dream. In talking of poetry therefore we do

no more than link on our thoughts to the apperception masses already present in the young minds. Our only care should be to study and know the nature of these links "to reveal to the pupil new meanings within his power of comprehension and new beauties within his power of appreciation."

This preliminary discussion with the students about poetry, its material and life, the warp and woof, as it were, of its making should be followed up by a reading of such short and moving tales in verse as "Curfew shall not ring to-night," or "The Brothers," and "Fidelity" by Wordsworth. Here the narrative flows easy, the story is plain and exciting and the reader is left at the end with a vague, mysterious and yet powerful influence of such universal feelings of the human heart as love and spirit of self-sacrifice. The young soul feels 'disturbed.' At this stage the teacher should not spoil the 'effect' he has made by burdening the 'disturbed' spirits with lengthy and detailed explanations of the text, of the verse-form, rhythm or the rhyme. He may, however, appreciate the beauty of these poems in light of the simple talks on poetry he has had with the students. This would set them thinking. After the class has read and admired a number of short and moving narratives let them have songs and lyrics inspired by such concrete experience as form the dream-stuff of Wordsworth's "Solitary Reaper," "Daffodils," "Cuckoo" and such other poems. Too abstract a basis of some lyrics, as those of Shelley, may lack appeal to the very young students, but at the University stage the teacher might easily follow up the lyrics of incident and concrete experience by those of reflection and thought, and then by such long narrative poems as the "Prelude," and the highly-wrought idylls of Tennyson. Dramas of action and situation followed by the supreme character—studies of Shakespeare would provide an excellent adjunct to the study of poetry at all stages.

As for the methods of teaching there should be neither too much stress laid on analysis and tortured interpretation of textual subtleties as some of our German-minded teachers—and alas some examiners!—are fond of; nor should it be deemed sufficient by the teacher to run through the poem without doing full justice to the "perception of the exquisite blending of musical speech, beauty of picture and emotional tone" in the poems under study. The teacher should try to create a proper setting, a background of thought and feeling for the particular piece of poetry he is going to teach. He should do it by making the class see into the very soul of the 'Mood' which impelled the poet to write that particular poem. The 'Skylark' as sung by the poets, Wordsworth, Shelley and Meredith, might serve as an excellent example of how the same object touches depths of different variety and richness in different poets.

Personally I believe in the value of critical as well as biographical study of the poet along with the teaching of his works.

An artist is a living unity and it is a mistake to suppose that his works can bear intelligent scrutiny without a study of his experiences which made those works possible. Besides, a few salient facts of biography would make for a personal touch with his readers, and personal touch is always an asset to understanding. As the students grow in intelligence, insight, and literary appreciation, the time is ripe to give them just a little criticism taking care, however, that it does not lie like an accretion on their aesthetic perceptions, but links itself on to their mental experiences.

It is no doubt as difficult to explain poetry as to explain the transient beauty of the rainbow or the charm of humour but the task has to be faced. If the teacher is enthusiastic, well-read, sympathetic and of a poetic temperament he will take care to make the gentlest as well as the widest appeal to the aesthetic faculty of his students. He will not take their sleeping imagination by storm. He should know that the young heart loves stories, loves sounds, colours and pictures; that it is deeply alive to the influence of such elemental human passions as joy, sorrow, love and charity. Knowing all this and much more, the wise teacher uses them all with skill and sympathy and turns his lessons into a source of delight for himself as well as for those who hear him.

The moral and aesthetic advantages of such a training in imagination are incalculable.

As Shelley says in his famous 'Defence of Poetry': "The greatest secret of morals is love or a going out of our nature and an identification of ourselves with the beautiful which exist in thought, action or person not our own. A man to be greatly good must imagine intensely and comprehensively. The greatest instrument of moral good is the imagination; and the poetry administers to the effect by acting upon the cause."

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COMMUNITY WORK IN THE PUNJAB.

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I want to write a little about the result of six years' continuous and intensive study of village life in one of the most ignorant, backward and poverty-stricken districts in the Punjab, and the methods being employed to deal with the evils discovered during the course of this study.

I will start with brief description of the place and the people and the conditions in which they live.

As for the observer—he is by early environment and upbringing in complete sympathy with the villager. I was brought up in a small village eight miles from a town, seven miles from a railway station and five miles from a telegraph office. We used the village carrier for our shopping. We got our water from a pump in the backyard and there is no domestic fatigue indoors or out-of-doors that I have not done continuously, not for fun but to keep the home fires burning. So I ought to know where the shoe pinches in village life.

As for the country with which we deal it is extremely varied. The sand and climate of Rewari resemble Rajputana and there the persistent Ahir makes a living where most tribes would starve. We have hills, bare stony hills, denuded of forest which shout aloud for afforestation and are now only a menace to the people living below them, there is the marsh area of Nuh rapidly becoming depopulated by disease and neglect, the small canal area of Palwal in the south-east with its solid Jats and their filthy villages, and the Jumna Kadir also rapidly becoming depopulated. The south of the District is all Meos—our biggest tribe—a very large tribe fairly recently converted to Islam, whose origin is unknown intensely backward and degraded, very tribal, full of intelligence and groping for the light probably more keenly than any tribe in the district, but cursed by their habits of idleness and quarrelsomeness and inability to stick to anything for long.

North and east of the district is inhabited by mixed tribes of Rajputs, Gujars, Jats, Brahmans. Except for 30,000—40,000 acres near Palwal, we rely on an extremely uncertain rainfall and on wells for our living.

The ordinary Gurgaon villager is the child of parents married when they were immature, he was helped into the world by a woman of the lowest caste in the village, generally old, sometimes blind and always dirty. His early youth was spent playing in the dust on the village muck heap and in what might perhaps best be described as the latrine area. His eyes and nose were often running and flies settled in dozens on them and on his mouth. He was rarely if ever washed and never taught clean habits. He was much neglected by his mother as she was busy grinding corn and making dung-cakes for a large part of every day. If he was lucky he survived but his chances of complete escape from the accidents of early life in a Gurgaon village were not too great. One or both of his eyes were as likely as not damaged. He probably got one vaccination but no more and was no stranger to small-pox. Many of his brothers and sisters and play-mates died in infancy and childhood but it did not seem to bother either him or his parents much and if it was a girl no one cared at all. During the years he should have been 'at school' he idled about with other lads tending cattle and God knows what mischief he

did not learn there. In years of scarcity he did not get enough to fill his belly and what he did get was crudely cooked.

He attended an occasional fair with his parents and about the time he ought to be wondering whether he would get a chance of getting into his village eleven he was married with a display of wealth which crippled the family for ten years and started the cycle again. His married life will be full of disappointments. Many of his children will die at birth or soon after and his wife will frequently miscarry, and will be continually trying to nurse ailing children in complete ignorance both of their ailments and the proper remedies for them.

His father taught him what little he ever knew of agriculture, but could give satisfactory answers to very few of his questions and the blanks were filled in by copious references to a Providence which must have seemed to the lad peculiarly designed to prevent his deserving father getting the crops he earned. His father forgot to tell him that he did very little ploughing and what little he did do was with a pre-historic bit of twisted wood, that he put down next to no manure, sowed indifferent seed, had no rotation of crops and watered his fields in the most expensive way known to men.

Tragedy was never far from his life. There was little laughter or joy, little real companionship and many tears in his childhood, his home life was too hard to be really happy, he never really played like a healthy child; in fact he had no real childhood. His mother got no respect from either him or his father and she seemed to be a sort of God-given domestic drudge. I must not say his family was never happy. Spring and the cutting of the Rabi crops was a very jolly period unless plague turned the village into a charnel-house, and the beginning of the monsoon was delightful but the latter part of the monsoon with its flies and mosquitoes and continuous malaria and then the winter coming before he had recovered from the malaria, and he with entirely insufficient clothing if indeed he had any at all, were hard times indeed.

The degradation, the filth and the squalor in which our villagers live must be seen to be realised. Imagination cannot conceive it at all, and I would not believe it if I had not seen it and smelt for years, and, mark you, in every village I visit, I look for trouble. My wife has inspected thousands of babes and small children and she tells me the same tale. Wasting babies, crippled babies, deiscarded babies, babies being deliberately starved by wicked reversioners and all manner of unbelievable cruelty, misery, suffering and ugliness. All easily preventible, the result of slovenliness and ignorance. No wonder the school boy migrates to the town when he has received a sufficient smattering of education to open his eyes to the conditions in which he is living.

Let me note in passing that I do not claim that my remarks will apply literally all over the Punjab, but I do claim that for Gurgaon District and probably 100 miles or more all round Delhi I have given an absolutely accurate picture of present conditions. For other parts those of you with intimate knowledge of village life will know where I have over or under-stated the case. For Hindustan proper I have over-stated nothing.

The present position is as follows :—

The pre-historic system of agriculture, villages squalid and filthy beyond belief, people ignorant and degraded with a set of customs which are utterly opposed to any progress—moral, social, physical or material, and a system of education which touches none of these things and only makes the educated desire to escape elsewhere.

The villager refuses even to contemplate uplift. If you tell him to wash his children or release his wife from slavery and degradation to tidy up things and grow flowers, or to play games, he goes back at once to the two first principles of the struggle for existence, food and the continuance of the race. He has no time or energy for anything but winning bread and the continuance of the species. So great is the obsession that even if his sons get a smattering of education they continue in the same groove, and are apparently none the better for the schooling they had. The reason is obvious. His methods of agriculture and of living are so wasteful and uneconomic and primitive that work he never so hard he is never far from the margin of safety and he is so ravaged by disease that unless he marries in childhood and produces a long series of children he will soon be extinct.

The first thing, therefore, to do is to show the villager how to ease the struggle for existence. Fortunately this is very easy and simple and does not require anything heroic or the discovery of any new principles. A few quite simple improvements in agriculture will double his crops and a few simple reforms in his village life will halve his disease. We recently published a dialogue in which an imaginary Socrates proved to his village friends that if they wished to be considered human-beings they must do four things :—

(1) Dig pits for all their rubbish and muck and sweepings and keep their villages clean and use these pits as latrines,

(2) stop the making of dung-cakes as this ruins agriculture, makes the women filthy and degraded and prevents them looking after the children,

(3) make windows in their dark and cavelike houses,

(4) send the girls to school.

You have only to add rat-killing and inoculation, vaccination, mosquito nets, quinine, and the proper treatment of the drinking wells and the provision of bullock driven flour mills to relieve the women from grinding corn, and we can absolutely guarantee to double the crops and halve the disease.

This is the whole Gospel according to Gurgaon which we preach in and out of season by every means in our power and it is only the absence of money that prevents us doing very much more than we are doing. The cleaning up of the village, the uplifting of the women and the improvement of agriculture not by anything expensive or elaborate, by perfectly simple means obvious to all are the gist of what is needed in the villages. That is what has to be done and it requires no great acumen to say this, but how to do it is the real problem.

The problem seems to me to be to devise a system of education which will stimulate the educated not to flee from but to uplift village life, to strive for self-improvement instead of merely running away to the towns.

There are many departments at work, some in a small way and some in a bigger way. It seems to me that the Education Department should absorb the results of the labours of all other departments, and while utilising them as the new material of its village curriculum, infuse into it all its own spirit, the spirit of scouting, of unselfishness and of service, of play for play's sake and of uplift for uplift sake, of culture and all those influences we associate with true education.

Not only is our rural education defective but it does not seem to me that the training of our teachers and workers is entirely sound. We get various kinds of people trained at Lahore, Lyallpur and so on for various purposes, but they are of very little use for our purposes as they have all been trained on the wrong lines, and their present training is a real menace to the cause of rural uplift.

They have never learnt the dignity of labour, the first lesson we must teach the villager.

They arrive in smart clothes with a silver mounted cane, will not touch anything and will not carry anything or do anything themselves. They are the worst possible influence to allow the villager to come in contact with. He is only too ready to make his *kamin* or his wife do all the dirty work and it is the one thing we have to teach.

Secondly, every youth as soon as he acquires a smattering of education locks up his wife as a mark of respectability. This enslavement and locking up of the women is the greatest enemy we have to deal with, and our educated and uneducated, our leaders and intelligentsia, are the worst offenders and are spreading

it into villages where it was never known before, so that education is positively spreading the curse to the villages.

Thirdly, there is no spirit of service in our young educated men. Everyone is for himself, they tell you frankly they are "passing their time." How often do all our plans go astray because our worker is working solely for himself. How common is the complaint that instead of willing service fees are being extracted.

My wife and I visit the villagers together and separately and we are always hearing the same story that the shepherd is a wolf in disguise.

Perhaps we find that the people refuse to take their children to hospital—why? Because the last person to go—may be years ago but memories of unkindness are long—had to pay five rupees before the doctor would leave his chair and relieve the sufferings of his child. Please do not think that I am aiming a shaft specially at one profession. I only give this as an instance taken at random. My accusation is general and of course there are many notable exceptions in all departments. If our public servants were imbued with a spirit of service the things my wife and I see in the villages would be utterly impossible. The villages contain school-masters, patwaris, scouts, they are visited by many officials of many departments: Could the appalling state of things continue long if one-tenth of our public servants had any ideal of public service? My wife and I saw a woman with twin boys deliberately starving one to save the other as she had only milk for one and did not know how to feed the other. There was a dispensary within 3 miles where she could have learnt all about bottle feeding. Dozens of people must have seen the baby. No one had the public spirit to enquire and help.

You have no idea how the Gurgaon villager detests the itinerant departmental worker and it was only after years of work in the district that the villager allowed me to see how and why he was so prejudiced against the people Government sent for his apparent betterment. I always thought, and so does Government, that when an itinerating official has been appointed a spreading circle of uplift has been begun. Ask the villagers. They will tell you if they think they can trust you. A circle of paper uplift for the purposes of annual reports has undoubtedly been started, but unless the official is of the right kind, in thorough and natural sympathy with the villagers and anxious to help them, he will do more harm than good. Every official has a great barrier to break down before he can start helping the villagers and many never break it down at all, some never try to break it down.

The result is that in our uplift work we have a great obstacle to contend with, the suspicion of the people that anything

official must be selfish and cannot possibly be solely for their good. They are so used to the official with, so to speak, a sting in his tail, who sells his favours or is only there for his own good that they will not believe us when we preach the gospel of uplift.

This spirit of selfishness is partially fostered by the lack of discipline in the whole of our school and college life in the Punjab. Without discipline you cannot teach self-control and without self-control you cannot have the spirit of self-denial and of public service.

If the Education Department will instil into those who go through its institutions the spirit of service, by scouting, by the example of the teacher by any means they can, the uplift of the province will come about naturally and without any further effort.

I once wrote a pamphlet suggesting the starting of a public school on English lines for the education of the children of the well-to-do in the Punjab and I believe such a school would go a long way towards producing the type we want for our uplift work. The Punjab is full of the very best material but I think we spoil it in the making.

Another great obstacle in our way is the low rate of wages for all literate labour which encourages and indeed makes necessary all forms of undesirable selfishness. The Education Department should set its face against low wages. A spirit of service may survive a period of wages pitched below the economic minimum but it will not be born in such a period, and if we want willing labour we must be ready to pay for it. This is not an extravagance, it is the simplest and most obvious form of economy, but it is far the hardest to learn.

I say this with confidence, that our main need is a spirit of service, as we see that this has happened elsewhere. What has uplifted rural England? The lamp of culture was kept alight, the example set to others and the work started by the country parson and his wife and by the squire. One or two families in each village were the leaven that leavened the whole lump.

Now who is going to take their place in the rural Punjab? There can be only one answer: the village schoolmaster, the village guide (I will come to him again later), and in time their wives. That is the ideal to my mind for the Education Department to put before it. So to train the rural workers that they will do what has been done and is being done in England by the country parson and his wife. I again speak from experience as my father was all his life a country parson.

The village schoolmaster, with his school library, his night school and his scouts, and the village guide with his little room in every village—part library, part club, part exhibition, known to, and the welcome friend and adviser of, every family in his circle must be centres of uplift and culture and they must be so trained that they can solve all the simple problems of the villager, whether they are agricultural, public health, social or moral. What he cannot do himself the teacher must refer to the expert and unless the expert is also imbued with the spirit of service, the chain will be broken and the work set back.

In addition to the knowledge that will give the worker confidence to show how essential the spirit of service is to the success of any scheme of uplift, and the uselessness of mere knowledge, you have only to look at the ex-soldier and ex-officer in the Gurgaon district. He came home in thousands after the war well grounded in hygiene and knowing full well how to protect himself and his family from the more common epidemic, but he shed his knowledge with his uniform and dropped straight back into village life and is now not a whit better than his neighbour. His wife turned his mosquito nets into shirts and that was the end of it.

At present our education in the villages is a square peg in a round hole. We are doing good but as it were by accident, and we are doing a certain amount of harm, by producing a lot of waste products which cannot fit into the life of the village. Our material is excellent but our rural education instead of turning the village boys into better and more intelligent followers of their fathers' professions produces in them a contempt for their fathers' professions, a contempt for their fathers and a hatred of their homes, and a burning ambition to wield a pen in an office for the rest of their lives and become indifferent *babus*. I conclude that there is some misdirection in our efforts, some fault in our methods and possibly some uncertainty as to what our real objects are and what they should be.

The modest aim of the Education Department in the rural areas is the removal of illiteracy. Is this right in itself and is it sufficient?

The removal of illiteracy in England was merely the opening of the doors of a treasure house of literature unequalled in the history of the world. But not only was the new literate surrounded by a wealth of the most wonderful literature but he was surrounded by willing and capable guides to show him how to read, what to read and to help him in every effort at self-improvement. Where is all this in rural India?

The existence of the English Bible alone, to say nothing of the vast and wonderful literature available was ample justification for the introduction of compulsory education in England,

but what is there in the Punjab for our youths to exercise their newly acquired art on? What have we in simple Urdu or Punjabi to correspond to the Bible? Where is Captain Marryat, Henty, Alice in Wonderland, Robinson Crusoe and all the rest? Where are the wonderful children's books we have in England? The Education Department proposes to bring all the children of the Punjab to a feast but the table is almost bare. It is a rather naughty suggestion but I am irresistibly reminded of old mother Hubbard. Had we not better fill the cupboard before coaxing the old dog up to the door? We complain that there is no love of reading. This is true and is part of the instinct I have mentioned before, the obsession of the elemental struggle for existence which still persists even where conditions have much improved. Even so where is the literature for them to read if they did love reading? I fancy that if the literature came into being the desire to read would soon be born. There is no bookshop in the Gurgaon district I believe and I also believe that there would be very few books to sell for the rural reader even if there was a shop. I think that one of the most important functions of the Education Department is to patronise literature and strive to encourage the production of books worth reading, not goody goody and uplift stuff, but real good readable books both for boys and girls and for grown-ups as well. The best seller in Gurgaon is the copy of the criminal and civil judgments produced by my copyists, and there are a dozen or more hard at work producing this pestilential literature.

Litigation provides both the literature and the sport of rural Gurgaon. The Education Department must kill this, by encouraging the production of good books and reorientating the village youth so that he will develop a passion for games. At present the struggle for existence forbids the existence of a desire for games. There is no boyhood or girlhood in Gurgaon. They leap straight from childhood into parenthood, so where is the place for games? Any time or money to spare goes into those off-shoots of the struggle for existence, the hoarding of jewellery, litigation, expensive social customs, and so on.

A lot of stress is now being laid on the starting of rural games but you must first produce the atmosphere and the conditions in which games are possible. The Indian parent and the Indian boy regard games, like the tidying up of the village or the growing of flowers, as a useless and wicked waste of time. There is no place to play in, no money or material for games, and no desire to play, in fact absolute opposition from parents and boys alike. You must first change the whole outlook on life of the boys and parents by reducing the severity of the struggle for existence and then I think games will come quick enough. All young things want to play, the instinct is there and will assert itself if you will produce the conditions requisite for it to come into force.

I had some little nieces who when any game or spree was suggested used to agree or disagree according as they thought it was good for them. They were not very happy over it either. Childhood has no business to think of what is good for it. The old division of everything into work and play was not at all bad. The Indian villager will work hard enough, it is the terrible old instinct of the struggle for existence. We have to make him play for play's sake, to induce him to cultivate the glorious world of things beautiful for their own sake to lift his eyes from the sordid struggle for existence to something higher. We want to bind his children's eyes to this struggle till they leave school so that they may start the struggle fresh and well equipped with whatever of culture, of laughter and of health and spirits we can give them.

Besides accusing the rural Indian boy of having no desire to play we accuse him of having no curiosity. This again is incorrect psychology. He is just as curious as every other young thing but there is no one to satisfy it in the village and it is finally atrophied and he learns to take everything for granted. He comes to believe a divine or daemonic interference in everything as probably his father and other villagers can give no good reasons—and he drifts into apathy and irreligion. As soon as we can produce teachers who really know something of the cause of things I think we shall find our village boy just as curious as another.

We must introduce simple books and lessons on natural history, on birds and beasts, flowers, and butterflies and moths, beetles and all the other innumerable and wonderful forms of life that pervade village life.

What should exactly be our real aim in rural education? It cannot be same as in England as the conditions are entirely different. There where compulsory education was introduced you had already long established agencies of uplift, people ready to give a helping hand in any kind of way; libraries in every village, the squires and the parsons and the doctors.

In our villages we have indescribable filth, squalidity and depravity, with no redeeming influence whatever, often for many villages together no one who can read or write and where they can read and write there is nothing to read and they have no desire to learn anything or improve anything. The idea and instinct of self-improvement is completely wanting. There is also great idleness for long periods. Gurgaon agriculture demands much work for two months in the spring and two in the autumn, for the rest of the year there is not a great deal to do except for the comparatively few who have to irrigate crops from wells. The women, except in the few small tribes which observe purdah, do all the drudgery and for weeks together the men do not work at all, they sit down on *charpoy*s and smoke, and there is no reading and little communication with the outside world, so there is nothing to

talk about and no new ideas to discuss, so with Satan's help they hatch enough mischief to keep them poor for the rest of the year.

Even for the literate there is no newspaper, no library, no mental food at all, so that it is doubtful if they gain anything at all from learning to read and write.

What then is our object in the village school ?

Literacy can only be a means to an end, not an end into itself. In our villages it is a means to no end as there is no literature.

So it is no use introducing literacy if we don't introduce also books to exercise the newly won knowledge on. Nowhere in my service in Gurgaon have I come across any desire for knowledge or culture for their own sake. The whole of the education introduced by us is strictly and hideously of examination text-books and produces not the faintest desire to do anything but earn money. No one takes photographs, no one collects butterflies, no one studies birds, no one gardens, no one sings.

What then is to be on our banner ?

Sweetness and light is one way of expressing it. Uplift is another. It is a horrid word but it does convey what I mean. We go into the villages to rescue the women from their present degradation and make them the equal partners of the men. We go into the villages to eliminate filth, squalor, depravity, and make the villages sweet, habitable and even comfortable ; we want to remove grinding poverty and the fear of famine by teaching them the rudiments of profitable agriculture, we will teach the dignity of labour, the profitableness of intelligent labour, the indignity of dirt, slovenliness and idleness. We will remove the fear of disease and death by teaching the rudiments of public health. We will sow the seeds of a desire for self-improvement, and we will teach the joy of culture for its own sake, play for its own sake, we will introduce boyhood and girlhood, we will make the villagers healthy and happy, give them some leisure and teach them how to use it.

The whole outlook on life of the villager and all his ideals must be changed. What is the villager thinking about now or when does he think at all ? Certainly not how to make two blades of corn grow where only one grows now. His wife is certainly not thinking out how to make bajra flour into something nicer to eat nor about how to make warm clothes for her baby.

The man may be thinking about how to do down some hereditary enemy, or how to get money for the next appeal in his family law-suit, or for the next marriage or ceremony he must finance. His wife may be thinking about her jewellery.

How is this great change to come about ? To my mind it can only be by the reshaping of rural education both as to its spirit and object and its actual curriculum.

As to its spirit we have to teach the two first great principles of the equality of women and dignity of labour, along with :—

- (1) indignity of dirt, idleness and slovenliness,
- (2) labour to be profitable must be intelligent,
- (3) the ideal of service.

The curriculum must contain a sufficient amount of agriculture, handicrafts, public health and hygiene, infant welfare, and all the other things necessary for the self-contained life of the village to convince the village boy before he leaves school that he can make a living out of the soil, he and his family can be happy, well-fed and well-clothed, without ever leaving the village or abandoning his ancestral occupation. Village life is so hideously uncomfortable and squalid now that every boy who can, migrates as soon as he has acquired enough schooling to realise the horror of village existence.

Teach them at school until it is a second nature to them, that they can easily put their village right, and put into them the spirit to do so instead of running away. Every boy that migrates is merely intensifying the economic and social trouble of rural life, he is a waste product, the money spent on his schooling has been lost, he might have uplifted his village but by running away with his brains and his schooling he has merely pushed it further down. All these entrance-pass boys wandering about in search of babuships are a mere waste product and as they are the only product, it is a very very serious outlook indeed.

We must stop teaching solely examination text-books ; and we must kill the craze for passing examinations. We must teach the children to play and to sing, to study and to love nature, to know and love the birds and butterflies and flowers.

Can you imagine an English cottage or house without flowers, and yet think of India, not only a cottage without flowers, but a whole village, a whole district, a whole province utterly without flowers and that in a country where they bloom all the year round—what a sin against the light ? And who is to blame ? Who will be beaten with more stripes ? We who know and do not help, or those who are ignorant ? It is our duty to spread the light and sweetness of culture, and we are often as bad offenders as every one else. Government is a terrible offender. It is considered a praiseworthy economy to do without flowers in the compounds of our offices. It might be in a country where every house and cottage bloomed with flowers but in a country where it is our sacred duty to teach the love of nature, it is a crime against the light not to have flowers in every office compound and in every school compound. Look at our buildings. Can anything be more ugly than most of them ? The one beautiful thing—and accidentally beautiful at that—Government is

responsible for, its canal banks and from these we drive the public instead of making them into boulevards and encouraging the public to use them.

You will make astonishing discoveries if you go into the villages as my wife and I do. You will find that neither the boys nor the girls can sing a good chorus or indeed sing at all, their parents would think it wrong if they did. They sometimes sing solos and the girls have some mournful chants, their whole life is mournful enough and so what wonder is it they cannot sing cheerful songs, but there is no such thing as good hearty singing.

Our village girls cannot sew, mend, knit or make clothes. This came to me as a shock but it is perfectly true, with of course occasional exceptions. How can they when their life is divided between grinding corn and making dung-cakes. They start bearing children in their early teens and are always tending ailing and dying babies, which should never have been born. They live in filth and squalor and are regarded as lower than the animals, given no schooling and no respect.

What is the use of educating the boys if you neglect the girls? Leave the boys alone and educate the girls and the country will be uplifted in leaps and bounds. The educated mother will see to it that all her children are educated. The educated father cares nothing, and how can an entrance-pass boy live happily with a woman whose chief occupation is the making of dung-cakes. You are simply inviting trouble by discriminating between the sexes in this wicked way. You put the brake on one wheel and spend vast sums on pulling the cart and then gasp in horror that the cart goes round and round in small circles instead of going forward. The raising of womankind, the teaching of the dignity of labour, the improvement of agriculture, the cleaning of the village and the adoption of a few simple measures of public health will bring in a new era of rural happiness in the Gurgaon District.

The improvement of agriculture will ease one part of the struggle for existence, the winning of bread and give leisure and money for culture, hobbies and pastimes and for the development of a desire to do things for their own sake and not solely for the winning of bread.

Public health measures will reduce the terrible mortality from dirt, disease and epidemics which make necessary early marriages and the production of vast numbers of children in the hope that some will survive and carry on the race.

In the shamilat we have a splendid chance of getting all the land we want for our purposes. When holdings are consolidated we must fight for the common land being preserved as such. Part must become pasture for the cattle, part play-ground for the boys and young men, part "company bagh" for the women and children.

When I say that there is no money and no leisure I am not entirely correct. The *hookah* is the curse of Gurgaon, and if I could get one-quarter of the time spent in smoking for the cleaning up of the village and other works of self-improvement, the people would soon be far happier and healthier. Similarly if I could get a quarter of money spent on social customs and ornaments, the interest on it would provide money for all the games and pastimes and culture that is wanted in rural Gurgaon.

But until the Education Department has changed the spirit of the villagers I cannot hope to get either the time or the money that the villages so badly need for their betterment.

The improvement of agriculture by itself is worse than useless. You must first teach the people how to use the money they do earn before enabling them to earn any more, as it will only be frittered away uselessly or harmfully as it is now. Uplift is everything! Better agriculture will come of itself once you uplift the villages.

Compulsory Education is a great feature of our programme, but in the present condition of village life it cannot but be a farce. Each man's fields are scattered all over the village, no fields are fenced and compulsion or no compulsion he must use his children to look after his fields and his cattle. If we want compulsion to be a reality we must consolidate the holdings and fence them in so that there will be no further need of *gwalies* and *rakhwalas*. Their occupation is at least a very idle one so that it will be unmitigated blessing if we can abolish it.

One great curse of rural life in Gurgaon is the menial castes. They say slavery caused the downfall of the Roman Empire and it has certainly caused the present degraded state of the Gurgaon peasantry. It is the presence of the menial castes alone which has made the peasant consider much of the work of the village beneath his dignity, hence if there were no menials there would be no need to teach the dignity of labour. It is the same in our schools, colleges and everywhere. We are surrounded by a horde of menials and are too grand to do our own work. The climate is fatally encouraging, the menials are there, why not use them? I plead guilty myself to yielding to the seductive influence, and I see it ingrained in everyone round me.

I should like to see all the menial castes removed lock, stock and barrel, given squares and set to work to reinstate themselves in the world but I realise that their sudden removal would dislocate life entirely. They should certainly be steadily removed and enfranchised so that they may cease to do menial work and degrade society or rather encourage society to degrade itself by making them do work society should do itself. Once the village menial disappeared the villager would soon learn to do his own chores and would be all the better for it.

There is another aspect of it, the menials themselves. They are often undernourished and without intelligence and without energy all because they are depressed and degraded and allowed to have no self-respect. It is the most degrading form of slavery imaginable, this caste moral slavery.

Yet a third advantage of abolishing the menial castes is that the zamindar will have to acquire sufficient intelligence and handicraft to do his own work. Now the helpless fellow is at the mercy of the barber, the carpenter, the smith and all the whole lot of people who make an easy living at his expense. Once they disappear the man with four sons will make one a smith and one a carpenter and one a boot-maker, and the fourth will plough the land. There will be a great dissemination of skill throughout the whole breed of cultivators which will enormously raise the standard of intelligence all round.

I should now like to say a little about what we are doing in Gurgaon to solve this problem. Besides a vast amount of propaganda literature of all kinds, songs, poems, dialogues, pictures, posters, leaflets, a weekly gazette and all manner of printed stuff, we have made and are continually making hundreds of lantern slides and giving hundreds of lectures, with and without slides. Then we have demonstrations, competitions and shows and finally we go from village to village and by every means of persuasion and inducement (they are many and varied), try and get what we want done. I am trying to force the pace as far as the microscopic funds at my disposal will allow, not because that is the best thing to do but because my time in Gurgaon must be limited and I want to get as far as I can before I leave and the natural reaction sets in. I feel that whatever I can get really established and appreciated will last and the more that lasts the less will be the re-action.

The great difficulty of progress is not the people but want of funds, and a great proportion of my time is wasted and I am unnecessarily overworked simply by being without the few rupees essential for the work. The people are thoroughly shaken up and you cannot go into the remotest village now without finding strong opinions one way or the other upon all the important points we are hammering in. It matters little if the opinion is for or against, the great thing is that we have awakened interest and criticism and started the people thinking. Once I can get a villager to begin scratching his head over over my nostrums my battle is won, the more hotly he opposes me the quicker will he be won over and the more staunch will be his support afterwards.

Besides all this we have two schools where we are trying to train men and women to carry on this uplift work both in the schools and in the villages. The school of Domestic Economy where we teach women, is only just started and is in an entirely experimental stage. We had the very greatest difficulty in getting

a teachers. Every institution and individual we applied to said they could recommend no one. The work was entirely new and they could think of no one to send us. Anyhow we have launched the enterprise; it is being watched and guided most carefully by Mrs. Brayne and myself and other helpers. There are many obstacles and difficulties and new problems crop up daily but things are going surprisingly well considering that we are on entirely new and unexplored ground.

We are trying to teach sewing, knitting, mending, cutting out and making of clothes, toy making, cooking, laundry, games, and singing, first-aid, children's welfare of all kinds, home and village hygiene and sanitation, public health, lecturing and the use of the magic lantern, flower gardening and everything we can think of to help them to make their homes and families clean, tidy, healthy and happy. Our students when they pass out will go some to the girls' schools, some as itinerant lecturers, but most important of all they will also go to the boys' schools. This last is one of our great experiments. We started last year and we now have about 600 girls in our boys' schools. The villagers' objections to this revolution are melting like snow in sunshine and we anticipate having at least 1,000 in before the end of the school year. Some schools have over a dozen girls and everywhere the movement is gaining popularity. It is being everywhere driven home that girls are to be treated the same as the boys, so as to remove this demoralising stigma now attaching to the female sex which works such degradation in village life. The girls have already passed their sisters in the girls' schools and we shall probably soon start closing down our girls' primary schools as the girls can be taught far better and far cheaper in the boys' schools for the primary classes. I have already refused to contemplate new boys' schools unless I am promised a fair sprinkling of girls as well as boys to start them. Our argument—which is unanswerable—is that if boys and girls can play together in the dirt and dust of the village muck heap all day without supervision, they can easily go to school together. We hope therefore to send female teachers to the boys' schools. They will take the girls in the peculiarly female subjects they have learnt at the school of Domestic Economy and will organise games for them. They will also occasionally lecture the boys on child welfare and other suitable subjects. The girls will learn three Rs. from the male teachers. We are hoping that village school teachers will soon begin to send their wives to this school, one has already done so—he is a student himself in the Rural School,—so that in a few years we shall have our village primary schools run by a male teacher trained in the School of Rural Economics and his wife trained in the School of Domestic Economics. If we can go on improving the teaching and above all the spirit of these schools, is it too optimistic to hope that these schools will in time introduce a new spirit into village life? The

School of Rural Economics is now in its second course. We have had infinite difficulties to surmount here ; the selection of the staff of course is of vital importance as it is the spirit that quickens, and I am still not satisfied with everything. Whatever else we teach we must teach the dignity of labour, and the ideal of service ; without these all our labours are useless and if we can get these it matters little what else we do or do not teach. The first batch of students was selected without knowledge of what we wanted or whither we were going. The second batch has been selected with far more knowledge and experience and are a very husky bunch. We know now what we are aiming at and I think we know how to get it. Along with the school teacher, students are the village guide students. These guides are to be preachers, propagandists and demonstrators of everything we have got to teach for the uplift of the villages. A dozen have already been appointed and the greatest of our experiments has begun. They are given one zail each and will be responsible for all our activities. They will have gradually to become acquainted with every family, give advice on all subjects, stimulate them to follow our instructions in self-improvement, urge them to clean and tidy up the children, the home and the village, send the boys and girls to school, vaccinate and inoculate at the right time, avoid useless expenditure, farm properly, open windows in the homes, use mosquito nets and quinine, and do everything according to the gospel of Gurgaon uplift. They will be supported by their convictions and persuasive power alone. I have forbidden them any other kind of support at all. They move from village to village and develop a footing as they go and I want them to get a room in each village which will be their headquarters and where all their literature, samples of seed and implements, public health outfit and everything else will be kept. As the pamphlet published about them explains, they are to be the guide, philosopher and friend of the villager, there is to be nothing official about them and the more they can obtain the confidence of the villager the more successful they will be. May we hope that the guide and the new teacher and his wife will one day take the place of the parson and his wife ? Forgive my optimism but if one is not optimistic there is no object in living at all.

The actual subjects taught at this rural school are scouting, agriculture, first-aid, public health, co-operation, a little veterinary work, singing, playing games, and anything else we can think of from time to time. They do all their own chores but these are not yet as popular as I hope they will be. In both schools we are ever on the look-out for new ideas and new suggestions. We shall go on developing them and improving them and striving to get the right spirit into the staff and students. I still think we have a lot of ground to cover before we have attained our ideal but we are painfully alive to our shortcomings and are leaving no stone unturned to improve these institutions, as apart from them we see no other possible means of spreading the gospel of uplift to the villages of our district.

I may say that even in our training establishment the school of Rural Economics, the battle for the dignity of labour has not yet by any means been won. The students still shrink from the spade and the saw and so I suspect do their teachers, there is no alacrity in doing the chores and the spirit of social service has hardly been born.

The ground-work for the training is scouting, agriculture, and chores, as by them we hope to teach the dignity of labour and the spirit of service.

There are four things to teach the villager and to teach the worker who is to go to the villages :--

- (1) the dignity of labour,
- (2) the dignity of woman,
- (3) the dignity of cleanliness,
- (4) the dignity of service.

If the Education Department will put that into their village curriculum it matters nothing what else is or is not taught in the villages.

Please note throughout that I only claim to speak for Gurgaon and as far as Gurgaon is concerned, I claim that my picture is painted in true colours. If you think it is too highly coloured and that I have over-emphasised the squalor and the degradation of the women come out with Mrs. Brayne or myself and see and hear and smell for yourself.

THE SUBSTITUTION METHOD.

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Our object in learning a foreign language is to equip ourselves with an additional means for expressing our thoughts. We have already at hand in the shape of our Vernacular a medium for thought expression that has been obtained as it were automatically. Language habits have been formed almost without conscious effort, and thought is expressed by means of the Vernacular without conscious attention being paid to grammar or idiom. To be able to use the foreign language equally unconsciously is the goal that the learner sets before himself, whether his object is to write it, or to speak it. Boys and girls beginning English hope to be able some day to use English without having to worry about the grammar, construction and idiom of sentences. They are not prepared however to spend the time over the business that they spent in learning their Vernacular. It is here then, that the teacher's work comes in. He has to enable the learner to gain command of this new language, by methods which will

shorten very considerably the time spent on the work and which at the same time will embody as far as possible the points of the natural method, as we may call it, by which the Vernacular was learned; for this method is evidently a successful one. He has to model his methods on those by which the child learns to speak, and at the same time has to intensify those methods, fastening on to the salient points and emphasizing those points which are important. We must apply the methods of nature in a concentrated form.

In learning a language as with so many other things in life we find that we are dealing with something that is largely a question of habit. Now in a forming habit, the most important thing is repetition and practice. Forming new language habits can be done successfully only in the same way as it was done in the case of the Vernacular, *viz.*, by practice. We need then a practice method, that is, a method that will enable the child to get so much practice as the various new forms with which he comes in contact, that they will become automatic. This then must be the first point in our method. We have next to decide what unit we are going to use for the purpose of teaching these new habits. All are agreed that this unit is the sentence. The method we employ then should be one which will give the child as large as possible a number of automatic sentences in the new language, in as short as possible a time. One other point that we have to watch is that we use a method that will allow as few opportunities as possible for the formation of wrong habits. In language as in other departments of life it seems as though it were much easier to form the wrong habit than the right one. Anyone who has taught a language knows how surprisingly early wrong habits are formed. This is very largely due to the strong tendency that the child has to literal translation. We get such efforts as "His both feet are on the floor." Such bad habits persist for a long time and are very difficult to eradicate. We need then a method that will minimise this danger as far as possible.

Now the direct method while admirable up to a point, will take us up to a point only. We need something that will take us further and that not will let us down just at the difficult spot. It is here that the substitution method comes to our aid. This is a method whose value is becoming increasingly recognised and which is being increasingly used in the teaching of languages. It is not a substitute for the direct method. It is essentially a practice method and can be used along with the direct method and also far beyond the point where the direct method fails. It supplies us with a method by which the child may acquire new linguistic habits in a minimum of time.

The basis of the method is the model sentence. We take some construction or idiom and embody it in a sentence, as for

example :

As soon as the bell rang he ran away.

Here we have embodied the construction of "as soon as." This model sentence is taught thoroughly in conjunction with its vernacular equivalent until it has been mastered. Then for each term in the model sentence we substitute other terms, leaving the constructional framework unchanged. Thus for "the bell rang" we can substitute such terms as "the master came," "the door opened," "the door shut" and for the term "he ran away" we can substitute such phrases as "they went in," "I spoke," "he came out." To take another example, in the model sentence :

There are seven pictures in this room.

We have four terms "there are," "seven," "pictures," "in this room." The first term "there are" will remain constant as it is the basis of the construction, but for each of the other terms we can substitute other similar terms. Thus for "seven" we can substitute any other numeral or the words "no," "several", etc. For "pictures" other nouns such as "desks," "men," "women," can be substituted and so on. Thus the model sentence is used as a framework or mould and into this mould we fit other words and so enable the child to convert the one fluent sentence into a large number of other equally fluent and idiomatic sentences. As will be explained later all this is done in conjunction with the vernacular equivalents of the various sentences. This is done in such a way that there is no word for word translation. The vernacular has to be used in order to bring into the child's mind the thought that we wish to have expressed in English. But the sentence is the unit and for a sentence in the vernacular the child gives a complete sentence in English expressing the same thought. As will be seen from the detailed description of the way in which the method is used it provides a safeguard against word for word translation.

The substitution is not done all at once but is taken step by step. It is most important that before any substitution is commenced the model sentence should be thoroughly well known. The success of the method largely depends on this. Every child in the class should be able to repeat the model sentence at ordinary speaking speed with correct pronunciation, expression and intonation. This may seem to be slow going and it may seem that more time than can well be spared is wasted at this stage. It is worth it however, and will result in much greater speed and much faster progress later on. Constant repetition is necessary, but it pays and there will be no difficulty in maintaining interest. The model sentence should be so well known that it can be repeated automatically, on hearing the vernacular equivalent, at speaking speed. That this can be done is the test by which we know that we are in a fair way to establishing a new language habit.

Once the model sentence has been decided on, it is then necessary to form tables, that is to make up lists of words and terms, which can be substituted for the terms of the model sentence, without straining or destroying construction or sense. When this has been done the teacher has a ready means for quickly and satisfactorily teaching the idiom or construction of his model sentence.

Objects of the Substitution Method.

The following are the objects of the Method :—

- (1) To enable the child to form automatic habits in the new languages ; that is, in English.
- (2) To prevent the child forming wrong habits.
- (3) To provide a large number of useful and usable sentences.
- (4) To give the child a ready command over idioms.
- (5) To train the ear to understand rapid speech.
- (6) To ensure correctness of pronunciation while speaking fluently.
- (7) To ensure correctness of intonation and expression.
- (8) To teach the child the habit of learning sentences and not simply words.
- (9) To give a practical method of teaching grammar.
- (10) To act as a corrective against literal word for word translation.

In this as in other work the reader will be made the basis of instruction. As far as possible the model sentences should be chosen from the reader that is being used. If a good reader is in use this is not difficult. If the reader is well graduated then the sentence will be automatically graded. It will not be possible of course to find all the substitution sentences in the reader. These the teacher must frame for himself. He should take care however that if possible the sentences should have some bearing on the subject of the lesson from which the model sentence has been taken. Very often this may not be possible but at any rate, it is essential that all the substitutions should be sentences that could be commonly used. It is no use teaching the boy sentences that he will never use. Very often however it is possible to frame tables where all the sentences have reference to the subject of the lesson being studied. Suppose we have a lesson on a lion and the teacher wishes to teach the use of "So.....that". He might take as a model sentence :

The lion was so big that I was astonished.

Then the following substitutions might be framed :—

His roaring was so loud that we were frightened.

His cage was so strong that he could not get out.

His claws were so strong that he could tear his food.

The co-ordination of the tables with the subject matter of the lesson is important as the sentences should be used in conversation after they have been mastered.

How to use the tables.

The following is the method to be adopted in using the tables. We will take the following table as an example :—

I am busy all day.

We are thirsty all morning.

You are hot all night.

They are cold all afternoon.

The model sentence on which the table is framed is,
I am busy all day.

The teacher repeats this carefully several times, the class listening. He speaks slowly at first and then gradually increases his speed. The class then repeats the sentence after him until they can say it fluently, the teacher meanwhile correcting any mistakes in pronunciation that he notices. Then the sentence is repeated by individual children and corrections in pronunciation, expression and intonation made, as may be necessary. When the model sentence has been mastered, that is when it can be repeated fluently at normal speaking speed, the next step may be proceeded with. It is most important that the model sentence should be really mastered before proceeding, since all further progress depends on knowledge of it. The next step is to give the Vernacular equivalent of the model sentence. The teacher gives,

Din bhar main mashgul rahta hun

and gets various boys to give him the English for this, that is the model sentence. He must insist on the sentence coming quickly in response to the vernacular one. When he is satisfied that the class understands that the one is the equivalent of the other, and that they can use the English sentence freely and without hesitation, he can proceed with substitution, first writing the English sentence on the board.

In this model sentence there are three terms, of which the pronoun and the verb form the first, the adjective the second and the adverbial phrase the third. Substitution will start with the first term. The teacher gives the sentence,

Din bhar wuh mashgul rahta hai,

and should have little difficulty in getting the answer,

He is busy all day.

After this has been practised he proceeds in a similar way with the other pronouns, giving the vernacular equivalent first and getting the English for each variation. When the class can give correctly the English for any sentence, the teacher writes the pronouns with the corresponding verbs under the pronoun and verb of the model sentence. The table will then appear as follows on the board :—

I	am	busy	all day.
He	is		
We	are		
You	are		
They	are		
She	is		

The teacher now proceeds to substitute for the second term, “ busy ”. Thus he gives the sentence,

Din bhar main bhuka rahta hun,

and gives the English for it, and then gets it from the class. In the same way he substitutes thirsty, hot, etc., for busy, and when the new substitutions are known, changes the pronouns also. The class will now be able to give the English for such sentences as,

Din bhar wuh mashgul rahti hai

or Din bhar ham piyase rahte hain.

The newly substituted terms are now written on the board the table appearing thus :

I	am	busy	all day.
He	is	hungry	
We	are	thirsty	
You	are	hot	
They	are	cold	
She	is	sleepy	

The next step is to substitute for the final term, “ all day.” As before the teacher gives the vernacular with the equivalent of the new term in place of that of the old one. He gives,

Hafte bhar main mashgul rahta hun

and then proceeds as he did with the other terms. The table will now appear complete on the board, thus :

I	am	busy	all day.
He	is	hungry	all the week.
We	are	thirsty	all morning.
You	are	hot	all night.
They	are	cold	all afternoon.
She	is	sleepy	all evening.

Then covering the board the teacher mixes up the terms in any way as,

Rat bhar wuh nindase hain,
 or Tamam sham ham mashgul rahte hain,
 or Din bhar unhen garmi lagti hai,

and gets the English sentence for the vernacular one. After a little practice the class will be able to give the English for any combination of terms that the teacher can think of, and will be able to give it quickly. When a table such as this has been mastered the children have in their vocabulary a large number of sentences on this construction.

The final stage is to use the English sentences thus learned in conversation.

The table with which we have been dealing is one where the terms are mutually intercombinable, that is where any term can be used in conjunction with any other term. This is called a compound table. They are also simple tables. In these the substitution of several terms is done in one step. Such a table does not give nearly so many variations as a compound one but is easier to frame. An example of this type of table is :

The pen is to write with.

In this sentence there are two terms besides the verb and both must be substituted for in one step. After the first substitution the sentence will read,

The desk is to sit at.

Other substitutions will follow in like manner.

The window is to look through.

The book is to read.

Procedure in such a table is much simpler, but is harder for the boy, and the table is not so valuable inasmuch as it does not give nearly so many sentences.

This method provides the best possible way of teaching grammar, viz., by practice and use. If we wish to teach the construction of the comparative degree, we can frame a table on some such model sentence, as,

This boy is bigger than that boy.

We can make such substitutions as,

This horse is stronger than that horse.

This man is older than that man,

and so on. In this way the boy learns the rule through practising sentences illustrating it.

Again suppose we have to teach the difference between the use of "for" and "since." We can frame two tables one of which embodies the use of "for" and the other of which embodies the use of "since," as,

I have been living here for a year.

He has been working there for a month.

We have been staying here for a week.

and so on. And,

I have lived here since 1909.

He has worked here since last year.

We have stayed there since last Tuesday.

and so on. This grammatical knowledge is gained in a much more satisfactory way than by learning rules and then trying to put them into practice.

Remember :

1. The model sentence is the key to the successful use of the method. This sentence *must be thoroughly mastered*, and made automatic before substitution is commenced.

2. There must be no suggestion whatever of word for word translation. This is contrary to the whole principle of the method. It is the thought expressed in the vernacular sentences that we are translating into English and not the words.

3. Repetition and constant repetition are necessary. It is better to do a small number of tables thoroughly so that the sentences are really learned than to attempt to do a large number imperfectly.

4. The tables must be taught in the first place.

5. It will be found to be a great aid in teaching the tables to point out any differences between English and vernacular idiom ; such as differences in order of words in prepositional use, in usage and so on. We learn by contrast as well as by similarity.

6. The sentences when learned should as far as possible be used in conversation.

HINTS ON THE TEACHING OF ENGLISH IN SCHOOLS.

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My remarks are meant neither for the theorist nor for the teacher who believes that his duty ends with the success of his students in the University examination. I want particularly to address young teachers working in Indian schools who have the real good of their pupils at heart. I do not claim for the observations made in this paper the authority of writers on education; they are the direct outcome of the experience of one, who has dealt with thousands of students for a considerable number of years. I hope that your frank criticism will help us all to improve, to a great extent, our method of teaching English.

1. *Use of dictionary.*

Nothing distresses a teacher more than to see his honest efforts nullified by vicious practices in vogue, evils over which he has very little control. One such practice is the general use by our students of 'cribs' or so-called 'Notes,' which are in volume sometimes double the size of a prescribed text-book. I am sure you are all familiar with printed notes on text-books. It will be a mere waste of time to discuss their contents or to examine what stuff they present. Nor is there any doubt in my mind that they are very commonly used. Their enormous sale is a positive proof of their demand. If there is anyone here who thinks that I am exaggerating, let him pay a surprise visit to his Boarding House and see for himself that even the top boy of his class possesses these 'Notes.' But what harm is there, one may ask, if students use these books? They are written by people who are perhaps better qualified than many of the teachers. Students find in them what they require, the meanings of words are perhaps correct, explanations are exhaustive. If these notes are used judiciously by intelligent students they save a good deal of their time, which can be more profitably used in other ways. In short, the advocates of these notes may say that they supplement a teacher's work, instead of supplanting it. True, if success in the examination were the be-all and end-all of our efforts, the use of these notes would not be altogether harmful. But if we mean to teach English language to our students and our aim is to cultivate in our boys a taste for the study of books even after their school-life is over, the use of notes is decidedly injurious. Let us try to find out why it is so.

Students resort to the use of notes either when they are required to prepare a lesson at home or when they prepare themselves for an examination. Let me first examine the position, when a student prepares a lesson at home. A lesson can be effectively prepared only with the help of a dictionary, a tedious process, no doubt, in the beginning. Not only that, the right

use of dictionary requires discipline, patience, and discrimination. In the case of a stiff book or a difficult passage, it may take three quarters of an hour to prepare two pages, and yet the result may not be quite satisfactory. It is but natural that a student should feel the temptation to avoid all this trouble by consulting notes, wherein he gets ready-made material, in a cut and dried form. Unless the teacher is strict, a student succumbs to this temptation. Though the difficulty is thus easily tided over, little does the student understand that he has lost a valuable opportunity to train himself. His case is no better than that of a rich man who sends his servant to make a purchase from the bazar. Of course he gets the required article without much trouble to himself, but he is decidedly a loser compared with his poor neighbour, who goes to the market personally, examines other articles available and chooses the right thing after careful observation and investigation. While looking for the meaning of a word in his dictionary a student does not come across the right equivalent straight away, he has to wade through the whole article and if his dictionary is really worth the name, the time so spent amply repays him for the trouble. Frequent acquaintance with allied expressions and words ultimately develop into a pleasant familiarity. A casual lesson in the use of dictionary in the classroom will convince even the most sanguine teacher that our present generation of students is deficient in this capacity. Their slow speed in handling a dictionary and their awkward guesses in finding out the right meaning are a proof beyond any doubt that for the solution of their difficulties they have been daily consulting not this trusted friend but another less faithful though easily accessible.

Now I come to the use of notes, when a student prepares himself for an examination. Here a student feels almost helpless. Why ?

A very common practice with our students is the use of a rough note-book for taking the teacher's notes. There is one rough note-book for all subjects and notes are usually written with lead-pencil. Now just imagine a student writing his teacher's notes on English text-books. He scribbles a page or two, then he passes on to attend the mathematics period, there he uses three or four pages, then comes the science period and so on. In a day he uses six or seven pages and in about a month the whole note-book is used up. If we take into consideration all that our students have to do nowadays, it is too much to expect that an average boy, nay a good boy, will make a fair copy of his day's notes. He has no time to do it. Quarterly examinations take place after every three months and the annual examination after a year. During this period, he has used some five or six rough note-books. Can you possibly expect of a boy that he will preserve these five or six shabby note-books to revise his courses? His notes lie scattered here and there, some legible, some illegible

and all a confused mass. Whereas for collecting all these notes in one fair note-book a student has to work daily for half an hour or more and to submit himself to this discipline day after day and month after month, his easy going brother spends a rupee or two, buys printed notes from the bazar, escapes all that botheration and so far as the examination is concerned both of them are equally placed. No wonder then, that notes are popular with our students. So long as we allow them to use rough note-books in the class-room and permit pencil work, this evil will continue. Notes written in the margins of books are evidently meagre and do not serve the purpose. Can a teacher who seldom cares to dictate his explanations of words and expressions and never takes the trouble to see that students write them in ink in one note-book meant entirely for that purpose, I ask, can that teacher blame his students for using printed notes? When once a student has bought notes, he is bound to become less and less attentive to his teacher's lessons because he begins to feel that he has got a teacher at his house, who is easily accessible to him at all times.

This is my diagnosis of the evil so rampant in our schools. The evil is there, it is getting more and more acute, students don't feel its effects for the time being but if we have their real good at heart if we honestly feel that a dictionary is a better guide than printed notes, if we realise that students, overworked as they are in many other ways can't make a fair copy of their notes taken in the classroom, it is up to us to compel them to use their dictionary for preparing their lessons, it is up to us to dictate in the classroom all our notes in ink, in one note-book, which they should find no difficulty in consulting at the time of examination. Good and solid work, done carefully but steadily, even if the rate of progress is slow in the beginning, is bound to prove fruitful in the long run.

2. *Deterioration of Handwriting.*

Another evil that I have noticed insidiously creeping among our students is the deterioration of handwriting. It is not possible to give a convincing or tangible proof of my assertion, but those who have been examining hundreds of university papers from different centres, year after year, will bear me out in this matter. I do not intend to explain how we can improve the handwriting of students in our schools, that is a wide subject, in itself. I would confine myself to giving those reasons, which explain how our method of teaching leads to the deterioration of handwriting.

Since the introduction of the direct method of teaching English, it has become a common practice to require boys to express themselves in English, both in writing and speech. The domination of written examination in the middle department, whatever that may be due to, is making an increased demand on the writing capacity of little children. Questions are set on

text-books, which require pretty long answers. Students of tender age, whose muscles of arms and fingers are not yet fully developed, are required to write a lot at a stretch. Daily written work without the supervision of a teacher combined with a sustained effort during examination days does incalculable harm. The worst of it is that in all this work, matter counts for more than the manner of writing. So long as the answer is correct, a student gets full credit.

The evil is greatly intensified in the high department. Teachers dictate notes hurriedly in the class-room, because they are so anxious to complete all their courses; this is done not only in English but in other subjects as well, which are taught through the medium of English. In house-examinations, lengthy question papers are set, to answer which students have to write a good many pages. Just imagine students scribbling notes in the class-room daily, and in every term examination sitting for three or four days together and writing for six long hours a day, at a high pressure. Is it possible for them to write at ease a graceful hand? If we once realise that good handwriting is a great acquisition, an acquisition which lasts with us all through life, an acquisition which may make or mar the career of a student, we shall never require students of tender age to write anything which will injure their nerves on account of long strain, we shall help them to write everything slowly and steadily under our own supervision till they get accustomed to write a good hand. Even up to the end of 5th High class, we should never subject them to an unnecessary strain either in the class-room or in the examination hall. If every teacher makes it a point to attach value to hand-writing in every answer that he examines, be it in English, History, Geography or Science, if scribbling is discountenanced in all circumstances, I am sure our students will bless us when they enter the portals of a college or begin their career, because by the enforcement of this discipline we shall have given them something which will pay them in life.

3. *Teacher's Equipment.*

It is a truism to say that the more competent a teacher, the better fitted he is to do his work. We do not honestly believe that English is a living language, which grows and develops every day. As it is a foreign language to many of us, it is absolutely necessary that we should constantly enrich and renew our knowledge of it. It is a pity that the Education Department has so far devised no method of finding out whether a teacher's own knowledge is progressing or deteriorating. There is no special encouragement for the industrious and no punishment for the slack in this matter. Perhaps we have much to learn from the medical and other professions, which test the efficiency of their men in service by holding examinations from time to time. The general ability of a teacher is a valuable asset. It imperceptibly exercises a healthy and powerful influence on students'

minds. It can only be developed by constant and regular study, a fact hardly appreciated and a habit so little cultivated by many of us.

While some of the teachers develop a taste for the study of English language and literature, it has been noticed that they confine their choice of books only to that kind which appeal to them. No doubt even the study of such books is bound to do indirect good to students, but teachers should not forget that the study of juvenile literature is as necessary for them as the study of advanced literature. A teacher should be in constant touch with the books his students ought to read ; only then can he hope to enter fully into their lives. Let him not be content with recommending books, which he might have read in his school-days. He should always be on the outlook to find which new books, suitable for his students, are coming out. In short, a successful teacher of English should be a constant reader of juvenile literature ; this is the only way in which he can make a good selection of books for his library.

(ii) But the thing I want particularly to emphasise is this, that we do not do what we ask our students to do. A teacher asks his students to write a story but he never writes one himself. He sets an exercise to his class that they should describe a football match, yet he never tries his hand at a description. He would ask a student to describe orally a Persian wheel working, yet he himself never tries to give a connected description to his students. It is one thing to criticise and correct students' work and quite another to write a description and narrate a story. We shall do correction work much more effectively, if we ourselves also try some of the exercises set for composition written and oral. A teacher who feels diffidence in writing a description or whose own narration is halting or who feels nervous while addressing an assembly would not be justified in expecting that his students would acquire the habit of forcible expression. His class will be an enlarged image of himself reflecting all his weak points.

(iii) Our present generation of young teachers has another weak point in its equipment. These teachers are the product of our present method of teaching English, in which formal grammar has a very minor place. These young men never learnt any formal grammar in their school-days, in college they forget even the little that they had learnt at school. Training institutions do not provide any facility for making up this deficiency. The result is that their knowledge of English is mostly empirical. But a teacher must have an intimate knowledge of formal grammar in order to correct students' mistakes. Though he has to teach practical grammar, his own knowledge of formal grammar must be deep enough to enable him to distinguish right from wrong. A teacher whose knowledge of formal grammar is

shallow is like a doctor who practises surgery without having studied physiology and anatomy. He may be a successful teacher, but he will lack that confidence, which an intimate knowledge of formal grammar alone can give.

(iv) Another accomplishment of a good teacher of English is the mastery of a vernacular language. Perhaps it may appear strange at first, but a careful study of the mistakes which our students make in their composition work will make the point clear. A considerable number of these mistakes arise from the literal translation of vernacular idioms and constructions into English. These mistakes can be detected and eradicated only if the teacher is thoroughly conversant with the vernacular forms. If he can draw the attention of his students to this source of mistakes, they will avoid making them. Apart from this the appreciation of a beautiful passage or poem in English increases tenfold, if a parallel description or poem is quoted from a standard vernacular writer. The introduction of translation into the school syllabus makes it still more imperative that our knowledge of vernacular should be adequate, exact, and thorough. The mastery of a vernacular language is, therefore, an added qualification of a teacher of English.

(iv) *Teaching of Vernacular Languages.*

My last point for your consideration is the teaching of vernacular in our schools. At present this work is wholly in the hands of teachers whose conception of style is hopelessly poor. Logical arrangement of matter counts for very little with them. Variety of construction is something unknown. The result is that the teacher of English has not only to teach students how to write well but also to teach them how to *think* well. This latter half of his work can be easily done by the teacher of vernacular if he improves his method of teaching. If he were to set exercises in vernacular composition of the type that we set in English compositions, if he were to set exercises in vernacular grammar similar to what we do in English, half the battle will have been already won. But can all this be expected of our vernacular teachers? Not so long as their present method of teaching continues to hold the field. Teachers of English can show them the right way. They should do it now and then, at least in their own interest.

To sum up :—

The result of our labour as teachers of English will be more substantial.

1. If we insist on our boys using a dictionary.
2. If we prevent the present deterioration of handwriting.

3. If we, the teachers, cultivate the habit of studying, literary and juvenile books in English and standard works in vernacular, if we improve our knowledge of formal grammar and continue to practise writing composition exercises set to boys.

4. If we improve the teaching of vernacular with a view to enable boys to think in their own language and, lastly, if we offer necessary guidance to vernacular teachers in the matter of style and devising exercises in composition and grammar requiring intelligence.

THE APPROACH TO ENGLISH LITERATURE IN INTERMEDIATE AND DEGREE CLASSES.

BY DR. F. M. VELTE, F. C. COLLEGE, LAHORE.

At the very outset it may as well honestly be confessed that any approach to Literature in either Intermediate or Degree English classes must in most of our colleges—I should say all if I were not afraid of too much generalization—be decidedly cautious. The teacher of English Literature is everywhere faced with a disheartening condition of affairs. He often wonders if the results are worth the effort, and yet, I am glad to say, keeps at his somewhat thankless task.

An analysis of the reasons for this difficulty in the teaching of English Literature will, I believe, reveal the following things:—

First that there is a distressing lack of proper grounding in the schools in three things: in a knowledge of grammar and grammatical constructions, the bones of the language; in the formation of habits of reading and the desire to read for pleasure and not under compulsion; and in the development of any real power to think independently of prescribed authorities. I make this statement humbly as the conclusions of a college teacher, inexperienced and unversed in the teaching problems of the school: nor do I wish in any way to imply that teachers in the schools are entirely to blame. It may be, as Prof. M. G. Singh implied yesterday, the system they have to apply that is at fault.

In regard to grammar and grammatical construction I may say that in my own experience and that of my colleagues in Forman College of teaching Intermediate and even Degree classes in English composition it has been found that the boy who can write two errorless sentences in succession must be regarded as a phenomenon. This is not an exaggeration, but an incontrovertible fact. Why this state of affairs should be the case is a matter for the consideration of those of our English teachers who have the pronounced language complex rather than the literary complex to which I have already pleaded guilty. My

sole comment is this : that work which should have been done in the schools we find we are compelled to do in the colleges, and as a glaring though petty instance of existing conditions I offer the information that certain young men have been known to spell the words "young man" improperly even at the so-called M. A. stage of their development. I could cite many other foolish and persistent errors that might easily and ought to have been corrected at the very start in the school stage, and which at the college stage have become so much a matter of bad habit that they cannot be eradicated, but after all this paper does not purport to be a catalogue of such things.

Modern educational experts unite in telling us that all proper study should be based on the stimulation of interest in the taught, and this being the case I am at a loss to understand why so many students—the appropriateness of the name is often questionable—show such a marked aversion to anything that lies without the range of their text-books and that savours of reading for the mere joy of the thing. I consider this without question the greatest obstacle to the teaching of literature in our colleges, and yet I believe our Indian students can love and enjoy reading as much as any student in the West, but that in the great majority of cases they have not given the practice of reading a fair chance, largely because they have never been encouraged to do so.

Then again our Intermediate students have never learned how to think independently. I have learned personally to take a malicious delight in my classes in challenging and contradicting the viewpoint advanced by the text, partly in order to encourage intelligent revolt, partly because of the amusement afforded me by the dazed reaction expressed on their faces at my lack of fitting reverence for the authority under consideration.

But the statement, I realize, will at once be made in defence that it is difficult to think in a foreign tongue, that the problems of expression and comprehension are so complicated by the language difficulty that one must not expect too much of mere students. True, but the plea is only partially valid. As a test let the average Intermediate student write in his own language on a given subject, and how much has he got to say for himself? Is he logical and clear in his thought? Is he fresh and original? How does he compare along these lines with children of the same age in other lands? The comparison would, I fear, not be flattering, but comparisons in such cases especially—are odious, and perhaps on second thoughts unfair considering the village environment from which he comes. Still even making allowances for this lack of background he is lamentably weak in the power to think and to imagine.

However we must not burden the school system with all the blame. After all schools 'cut the cloth according to the coat', and if we consider the nature of our courses and our examinations we should not be surprised at the nature of our teaching. But of these matters more later. That the narrowness of our prescribed courses and the nature of our examination prove an obstacle to the teaching of a real love for English Literature is incontestable.

A third handicap to the teacher of English Literature in many of the colleges is the unwieldy size of the classes, too large for personal work. A fourth, the more or less current tendency to regard the study of English Literature as a means to an end rather than as an end worth achieving in itself. In other words we are living in a distinctly utilitarian age, and we want results that are tangible. We count our blessings in terms of rupees, annas and pies, and we say quite frankly that the reason why English should be studied is because it is a good business proposition. It is the common language of the country, and as such is the only avenue to a job. It is besides useful to the student of the Sciences to have a working knowledge of the language in which his text-books are for the most part written. Such a working knowledge, and no more, the teacher of English is supposed to give him. He is too busy in the service of Science to dabble in matters literary. Poetry or the drama might dull the scientific impulses that are the lode-star of the B. Sc. soul. They are, therefore, mercifully eliminated from his diet, and he goes on to take a degree which has involved no Shakespeare, or Wordsworth or Milton. Perhaps there is no harm in this but what hope is there for the teacher of English Literature when dealing with such a man?

I am personally quite convinced that our university students are permitted to specialize in their studies at too early an age. We let them narrow their studies before they have laid the foundation of general culture which should be the pre-requisite for what is really post-graduate work. It is this foundation of general culture that constitutes a well-rounded education. Such early specialization is especially to be noted in the Honours Schools in the double Mathematics B.A.—a hopeless substitute for a full education in the fact that our B.A. students can go through college without the slightest glimmerings of Science and our B.Sc.'s with but the faintest glimmerings of the Arts. We are preparing men for a living rather than for life.

Why not teach English purely and simply as a language, and not as literature at all? This is a contention that does not lack advocates, and advocates of approved standing. They may very easily be in the right, although a large majority of us I am sure would disagree with them. But it is certainly better to do language teaching well than to continue to do literature teaching badly.

However the cultural and educational value of English Literature properly taught is surely not to be despised ! It may not be convertible into cold cash, but if it does nothing else it provides a permanent joy. A taste for reading cultivated in the days of student-life stays with us as an abiding delight and solace. It is often the most precious things next to our home affections that we possess. Far more than clothes--or even motor-cars--books make the man.

And the joy to the student is not merely a joy of the future but a joy of the present. There are many students, I am glad to say, even under existing conditions who have found the joys of reading. I have found that literary clubs in which real reading has to be done and papers have to be prepared on literary subjects are easy rather than difficult things to organize. They have not been for the many but the few who have participated have done excellent work. We have had intelligent and intensely interesting discussions and the frank expression of personal likes and dislikes in literature without any trace of slavish fetich-worship. It does not require much imagination to see what enthusiasm might be generated in the student-body for reading, if we could only get away from the bugaboo of meticulous examinations on a diminutive circle of prescribed text-books.

We have already noted the lack of power to think and of imagination revealed by student compositions. A study of literature as literature that is as an expression of ideas and not a laboratory merely for language practice seems to me the soundest and most effective way to meet this need. For some students English provides the only avenue to the Arts. This is true of double Mathematics, B.A.'s and B.Sc's especially. It is the opening of windows of the imagination that would otherwise be closed, and the more we can open the better. English Literature can give an approach to History, or Philosophy or Sociology or a multitude of subjects which many students are otherwise unable to touch and this being the case, is it not worth while ? What other study affords the same opportunities as English for the acquisition of what we might call general knowledge ? And it is through the teaching of literature as literature more than as language that this end is attained.

In the Intermediate there has been since my first experiences of this university of ours in 1915 a reduction of the number of books to be read for the examination. This has been partly the result of a mistaken--at least so it seems to me--pity for our alleged overworked students, partly in order that teachers might concentrate more on the teaching of grammar and idioms. The quality of mercy may indeed be said to have been so strained that we have reduced our required reading to an irreducible minimum. If there had been a corresponding improvement in the use of written and spoken English, this would be nothing to groan

much over. But has there been? I may be mistaken but I have seen no marked improvement. Perhaps I am getting more critical after some years of teaching.

The reading done for pleasure by Intermediate students is of the Marie Corelli-Reynolds-Tarzan-of-the-Apes type, if any is done at all. This is especially true in cities like Lahore where the cinema is determining the standards of student taste and supplying our youth with their most effective avenue to the *fine arts*. The cinema has certainly resulted in a lowering of literary and artistic standards since so much stress is laid on the purely sensational and salacious. This is reflected, I find as staff editor of the college magazine, in the silly sentimental poems and stories that flood the editorial waste-paper basket. But the very fact that so many of these trashy tales or would-be lyrics do come in indicates a feeling after literature that unfortunately is half baked, improperly developed and unregulated.

Here is where the intelligent college or school librarian comes in. A librarian must be guide, philosopher and friend in matters of reading. He is not simply an ill-paid clerk for the issuing of books and overdue warnings but he should be able to prescribe reading to augment and widen the work done in class, especially in the English class. The college library should be attractive in appearance, it should be easily accessible; it should carry a reasonable number of first class periodicals like "Blackwood's" or "The Atlantic Monthly" or "Scribner's" or "The Forum." The librarian should endeavour to teach his clients a love of the beautiful in books, in their format, in their feel, in their appearance on the shelf and should encourage as far as possible the individual to build up his own little library, however small.

At this point I must express my resentment at the format of some of our text-books. Our students are poor, therefore, we say we must get out their text-books in the cheapest shape possible. The books are often so flimsy that they scarcely last until the examination. They are not intended to last any longer than until the examination in any case. Naturally the student concludes that they have an examination utility only. He does not regard them as worth keeping permanently. Some of them are not. But some are. I am and always shall be an advocate of the nice-looking book that can be prized and kept. It does not need to be expensive, any more than it needs to be shoddy, but this is a matter for English Board of Studies of which I happen to be a member.

Another practice, always decried but always prevalent, which does a very great deal to kill appreciation of the literary qualities of a book or an author is the typical cheap book of notes with explanations of all the difficult words and phrases. There is no way of estimating how much harm this type of vivisection accomplishes but it is certain that the nature of our courses, limited

as they are to intensive study of a very few texts, and the nature of our examinations which ask questions along these lines are responsible for the wide vogue of these books of notes. Perhaps more rapid reading of a larger number of books and less word for word study of a few might solve this problem. Certainly it would mean more extensive literary information and I am not at all sure that the wider reading would not at the same time mean greater familiarity with English as a written and spoken tongue and therefore increased grammatical efficiency. It may be objected that intensive study of a few books is more thorough and therefore more desirable but I wonder if it has really proved itself so. Wider reading ought to mean wider and keener interest, and keener interest would result in more voluntary reading, and more voluntary reading in greater familiarity with the language read, in getting what we might call the proper *feel of the words*.

Arousing interest in literature is the only way of approaching the teaching of literature with either Intermediate or Degree classes. This is the guiding principle here, as it is in all other branches of education. How are we to arouse interest then?

Some methods have already been suggested, but might be further developed. For example, every teacher who wants to teach English Literature must be prepared to teach English History too. It is ridiculous to try to teach English Literature or any other literature without considering the historical background. The School Board is to be congratulated on the introduction of a fuller course in English History. It is going to help us all round. Then too some conception of Geography is necessary. Also of classic myth and legend. In an extra-curricular course which last year we planned for our own students in F. C. C. we spent many profitable hours on the history and literature of Greece and Rome. It has meant a great deal to a very large number of our students whose ideas previously were very hazy or very wrong. I would include as another very valuable approach to literature some consideration, however sketchy, of art. We need more art-books in our college libraries, and even in our university library for that matter.

What are the types of books in English which Intermediate students in particular like. In the first place books or poems with a moral. How many of us have suffered under Longfellow's 'Psalm of Life'? We may not enjoy such preaching—personally I loathe it—but probably at the student's age we were as fond of it as he is, and his taste should be considered, to some extent. Again the student loves a story. We should give him plenty of stories and good stories at that to educate his taste above Marie Corelli and Co. Then again the Intermediate student and the Degree student too for that matter seems to enjoy poetry more than prose. The prose-poetry contention is a long contention dating from Dr. Elton or even some earlier time.

There is in some a strong feeling that our students cannot understand and do not appreciate poetry and that it is far more useful and profitable to limit ourselves to prose. As a result no poetry is required of our B.Sc's at all. I personally cannot subscribe to this view. Is it too arrogant to say that in this matter I am on the side of the angels? Perhaps. But in all my teaching—perhaps my own tastes have played some part in this state of affairs. I have found the reaction to poetry, even half-understood, far more satisfactory than that to prose. My colleagues in Forman College on my questioning them have confessed to the same experience. Poetry has held the student interest, and is, I find, something they remember when they go out. It sticks. I have met innumerable old boys of mine in the train and elsewhere, and in almost every case the question has been "Do you remember when you taught us such and such a poem or such and such a play?" and never—or hardly ever—such and such a selection of prose other than a novel or a story. These are facts which the Board of Studies in English does I think take into consideration when prescribing their meagre Intermediate and B. A. lists and facts which those of us who wish to prescribe necessary supplementary reading for our students should bear in mind.

I have spoken disparagingly of the contributions we often receive for college magazines, but I must speak also of the value of the college magazine to student and teacher alike. I regard the college magazine as a sort of laboratory for literary work. It should of course be a record of college activities but it need not stop at that. It can include a number of thoughtful literary articles or at least attempts at thoughtful expression of ideas on literary subjects on the part of students and if it is allowed to be only a collection of old jokes, or petty personals—often more malicious than humorous—is positively undesirable. If properly supervised and encouraged it can raise the whole tone and thought of the institution. Besides it is a clear index to the teacher of how students are thinking and wherein their peculiar interests and their peculiar deficiencies or faults in expression and imagination lie. As such it forms a very valuable means of deciding on the method of approach in literature teaching as it varies from time to time.

I have found the literary club another useful thing. It should be so limited in numbers that every member has to read not one but several papers which are then open to general discussion. This work can be done to the best advantage in a club of senior students with an occasional Intermediate student member in training, so to speak, to carry on the club traditions when he has reached the senior classes himself. It is better to have several clubs of small membership than one very large club—as a matter of fact one small club of interested men is about all one can organize with success at first. I do not mean a debating club

but a literary club pure and simple. Debating or public-speaking societies are quite a different thing and do not come within the province of this paper.

Of degree students something has been said already and I do not intend to say much more. I believe all B.A.'s should receive a course in the History of English Literature even though it be the mere outlines of English Literature. I believe that B.Sc's could profit by the study of some poetry and honestly do not see why their course should be a reduced course. If reduction is necessary cannot some of the science wait rather than their only taste of the Arts ? I do not believe in specialization at the B.A. stage as I do not think the students are ready for it. I believe that the Honours courses are far too flimsy to deserve the name and should be extended to provide a suitable preparation for the M. A. These are all personal opinions and all controversial, so I do not care to go into them farther.

In conclusion, the main approach to English Literature is to be found in the teacher himself, in his enthusiasm for his subject, and for his pupils and in his power to impress them with his own personality and enthusiasms. The teaching of Literature after all does not depend so much on a system as on a man. We can point out the ways *not* to do it, but it is harder to analyse the ways by which it is actually done. So much depends on the teacher's ideals, on his character, on his zeal for service, on his winsomeness of manner. If the schools and colleges find the right men, men of intelligence, and earnestness, and charm, and sane judgment, the Indian student can and will respond, and our students from being mere apostles of the stupid gospel of Cram will become readers and students in the truest and best sense of the word. And when they are that they will not have any doubt of the value and joy in the study of plain unadulterated literature and, in addition, their knowledge of English as a language is bound to increase very materially.

SOME OBSERVATIONS ON THE TEACHING OF ENGLISH IN SCHOOLS AND COLLEGES.

BY LALA KAHAN CHAND KHANNA, M.A.,

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English has been taught in this province for a long time now. It has been taught not for its own sake alone, as dead languages are taught, but it has been used as a medium of instruction for secondary and higher education. Naturally therefore this subject has attracted a considerable amount of attention both on the part of laymen and experts. There has been no dearth of discussion on it particularly during the last decade or so. It

would not therefore be out of place for me to make a few observations on the teaching of English in schools and colleges. My experience of teaching English for over seven years has brought home to my mind a few unwelcome truths which I wish to offer for discussion and criticism.

All intellectual growth has two aspects, each being as important as the other. One is comprehension, the other is expression. We try to comprehend whatever comes in our way. It may be something relating to science, or literature and then we try to express it in our own way by using our internal capacities of reasoning and imagination. The same can be said of the difficult art of learning a foreign tongue. We have to comprehend it ; then we have to express it. Keeping this in view we can divide the subject into four parts, the Art of Understanding, the Art of Reading, the Art of Speaking and the Art of Writing. The first two of these relate to comprehension and the last two to expression.

To deal with the first one in order of mention—the Art of Understanding. The aim here is that an Indian student at school may be able to understand common and plain English which is of everyday use as well as he understands his own vernacular, and at a later stage in college to follow all his advanced work in English technical or otherwise, at a greater speed, which would mean a considerable improvement in understanding. Now our secondary and higher study of English does not quite equip young men for the aim set before us. Though I must confess that comprehension is better developed than their expression, yet it is not accurate. I must lay this fault at the door of the teacher who in earlier stages is more often not so particular as he should be to know whether his boys have followed him or not. He should test the boys at every stage by asking questions, and insist on getting right answers. This will keep the boys very attentive. They will follow him all right, and will also be able to repeat what he says accurately. Past neglect in this matter has led to very bad consequences. The oral and written answers that students make are amazingly wide of the mark. This is all due to careless training in the beginning. Speaking of colleges, this is particularly the case with first year students in degree institutions. Very often lecturers who have been lecturing in about the same manner as they lecture to other classes find at the end of a talk to their great disappointment that the students have not understood more than one-fourth of all they said. There is this discrepancy of method which the new type of Intermediate college has tried to set right. If the understanding of our boys were fairly improved by the time they leave school we would be justified in giving continued talkings to them on subjects that are new. But as it is we have to go by the standard that is achieved at the secondary stage. Therefore a lecturer to intermediate classes would do well to ensure that

what he has said has been understood. He can verify that by asking questions of the class. This procedure will have another useful effect which I shall deal with under the heading of expression.

To come to the Art of Reading. Reading requires a good deal of comprehension, and of fuller type, as after reading a boy is expected to know what he has read; and having before him the whole matter is a tangible form he has to sort out the important from the unimportant. Reading is of two kinds—silent and aloud. It is naturally more possible to concentrate on the context when reading silently but the test of comprehension in that case only be made by either asking questions or demanding a written examination of some sort or the other. Whereas reading aloud is in itself to a considerable degree a test of comprehension. Neither at school nor at college are our boys given opportunities of practising reading aloud in classes to an extent that would give them a fair training in this direction. And the very few opportunities that a student gets are not enough. It should be stressed more at the elementary stage where the teacher is able to pay individual attention and train the boys both in comprehension and correct enunciation and intonation of English. My belief is that at present teachers are satisfied too early and do not ask enough questions from boys, so as to test their understanding as well as of their power of correct speech. And when the boys come to college practically no opportunity is offered to them in this direction; they keep listening to their lecturers all the time and do not get a fair chance to express what they have listened to. That is why we find in colleges that the standard of English remains low, and in the present circumstances, all things remaining same, I do not think there is the slightest chance for it to be raised. Many an oral examiner in English bears testimony to the fact that our boys often divorce comprehension from reading. Which means they are only making a physical effort to pronounce words without at the same time searching for the meaning; hence their reading is meaningless and insipid. They do not lay proper emphasis and the intonation is far from right. It is ludicrous to hear an average Indian reading English aloud. He starts on a low monotone and goes on more or less at the same pitch. He has no notion of reading poetry except that of balancing rhyme. This monotony is lifeless. But he is not to blame for it; he has never been taught differently. He therefore proceeds on the style of his own vernacular which is certainly less emphatic and less abrupt than English. Even at home our boys read very little outside their set books. And this trouble continues even up to the higher stage, so that they never develop a taste for reading books and newspapers or anything on their own account. Consequently they have a very poor vocabulary and a still poorer expression.

It is necessary here to make a reference to libraries. It is not wrong to say that in most of the schools in our province

libraries are not freely used by the boys. They seem to think that libraries are meant for the use of the teachers alone. Teachers of English would do well to take their classes to the library once a week and to suggest material to them, leaving it to the boys to make their final choice or they might bring a number of books and scatter them in the class or lend them to the boys. In any case it is very necessary that some interesting outside material should be offered to the boys for rapid reading at home. Students should also be encouraged to form the habit of consulting a dictionary rather than depend on cheap annotated editions which often make them idle and lead them astray. Another point that is worthy of note is that when new schools are being opened the department might insist on the provision of suitable libraries. Many a time it happens that institutions grow like mush-rooms but the libraries are far too scanty. And then there is no provision for regular issue of books.

We have hitherto fixed our attention on text-books in English at all stages. Even though in earlier classes teachers are not expected to finish their particular readers yet they have a tendency to show a fair amount of book work done during the year on the occasion of the inspectorial visits. This anxiety to finish set work is responsible for a considerable degree of harm that is done. Teachers are not given a free hand in teaching common and familiar English usages, which is really the work that ought to be done at school up to the Matric stage. It may be true that a fair proportion of teachers are not well equipped for this task; they probably feel more comfortable when they have to do work of a set kind than when they are given a free hand. This factor adds to the difficulty, but it does not take weight from the above argument. In this connection it may be pointed out that it is a healthy sign of the times that recently the School Board in this province has left the desirability of offering more rapid and extensive reading to candidates preparing for the Matric Examination and proportionately little of intensive work on set books.

Let me now say something about the Art of Speaking. I have no hesitation in saying that here we have gone considerably wide the mark. What-so-ever may be said of the power of expression by means of writing that an average young man acquires during the course of his instruction it is certainly true that his power of speech is hopelessly neglected. I want to say that not only is the expression not forthcoming but the manner of its utterance is absolutely wrong. Those of us who have made a study of the English language phonetically feel this all the more—this jarring effect of wholesale vernacular sounds uttered in the disguise of English. The intonation too is Vernacular. I have not enough time to dwell on the relationship that exists between phonetics and semantics. But I would like to say in passing, that our tone is a general index of our meaning, which is amplified

by the addition of words. The English tone schemes are different from the vernacular tones just as the English vowel and consonantal sounds are different from the vernacular sounds. If we do not make an attempt to learn these things we can never hope to enter into the spirit of the English language, and being ignorant ourselves will lead our flocks miserably astray with little or no hope of redemption. As pointed out before, teachers in the elementary stage get satisfied too early even considering whatever measure of correctness they have acquired themselves. The student never gets a regular and accurate drill of answering questions in school which would enable him to improve very much his power of understanding, accurate thinking and correct speech.

The teacher of English should have some phonetic training particularly in the early stages to enable³ him to command a certain amount of confidence in teaching correct sounds in pronunciation and correct tones in intonation. The importance of the study of phonetics cannot be over estimated in his case. Right pronunciation, enunciation, and intonation will take him far. Leaving aside the manner of speech, let the teacher use easy and familiar words, expressions and usages as many times and in as many different contexts as he can till the majority of boys have understood them and can reproduce them. Later on in oral and written composition he should give a certain degree of freedom to the boys to use the same words or expressions involving important and familiar grammatical constructions, in similar contexts to those in which he has used them in the class. He can never overdo this task, and it will not be altogether an unpleasant one. Oral composition should be the foundation of the written work and it is easily done, easily corrected, and easily repeated. I will readily confess that I have grave suspicions as regards the adequacy of the oral composition done at present in most of our schools.

In this connection I want to suggest that we should have a two-year course for the Junior Anglo-Vernacular Certificate Class. During the first year we should try to equip a prospective teacher for the teaching of English by training him on phonetic lines. I have reason to believe that he will be regarded as a very useful asset in every school.

To come to the last, the Art of Writing. As I said in the beginning, we have achieved a greater measure of success in this than in the others. Our educational system has produced men, who are, not a majority by any means, fairly well-up in expressing themselves in writing, sometimes to a degree that is marvellous indeed. It has been the result of our keeping the books before us as guide, and as a test of correctness. Those that have read a fair amount of English find that their vocabulary has been considerably widened, and their command over correct usages fairly certain. But here too there is a great draw back that one

cannot overlook. We keep book English before us as a model and so far as writing on formal subjects is concerned it is all right. When we come, however, to deal with subjects which will draw more upon our business familiarity and work-a-day notions of colloquial English we pause and think. It is because our ideal of teaching English in colleges has not altogether been the right one. We have aimed at teaching literature to our under-graduates with the common result that we have neither taught them literature nor language. There is no dearth of examples of first class men who can write decent English of a bookish sort but who have not a similar hold on the plain English language of everyday use. This trouble starts in school where we begin to give our boys practice in writing on formal subjects, without assuring ourselves as to their capacity to express themselves on plain ones.

I said just now that written work should be based on oral composition. At the end of a certain conversation carried on mutually between himself and the class the teacher should ask his boys to write on the subject they have been talking about. He will have already stimulated their thoughts in the right direction. A word regarding marking these exercises will not be out of place. If the teacher cannot correct the exercise of every boy in his presence at school for lack of time he might do the next best thing, which is to correct them at home and to point out weaknesses to every one individually. I have never thought that merely returning the corrected books with all sorts of red ink or pencil marks and crosses on them can do the slightest good. An average student never takes the trouble of studying his own shortcomings and all the labour of marking books is in vain. Again, the teacher should not lay so much emphasis on spelling, punctuation and capitals in the beginning. These are, after all, formal affairs. The object is to teach correct English and if a boy can express himself correctly without attending to some of these things he is not worse than one who is wrong in his expression but always spells words rightly. Even in oral composition this attempt to cling to the superficial and formal aspects of grammar leads the teacher away from his ideals. We should not lay so much stress on the technical terms and definitions as on correct grammatical usages.

I have tried to point out during the course of this paper that so far as the teaching of English is concerned the aim we have set before us is not right. We have shifted towards literature and ignored the language. Whereas what an average person can achieve during the course of his instruction is a certain degree of proficiency in the English language. Literature can easily follow suit, and if a person is keenly interested in it, he can take to it with as much eagerness as he possesses. A very suitable literary course of instruction should be provided by the University for the benefit of those that wish to profit by it. But for an average lot the teaching of the English language would be a big enough

task in itself. Such a work will probably produce some persons who might later on get interested in literature. That will be all for the good. But to force literature down the throat of everybody is really attempting an impossible task. I was told on very good authority that no University in England prescribes a compulsory course of Literature, though everyone offers one such for those that wish to take it. This being so why should we in India do so—we to whom English is a foreign language the learning of which is in itself very difficult task. Hitherto we have tried to kill two birds with one stone and have failed in teaching both language and literature by means of text-books, which are classics or very much like classics. Consequently the attention we have paid to doing this kind of intensive work has fixed the scholar's attention on books and books alone. That is why we remain largely unfamiliar with commoner expressions which are of use in everyday life, while we succeed in making a parody of book-English, which is called Babu English. The simple, easy, facile style of writing which is plain and direct is generally never developed, never attended to.

The conclusions are evident. We should provide a good deal of extensive and rapid reading instead of intensive book-work and the faculties of comprehension and expression can both be tested by giving exercises on that work to be done in class or at home. The B.A. curriculum has for the past few years provided for a general paper in English which aims exactly at this kind of thing. But the attention paid to general reading is indirect, irregular and perfunctory and the labour spent in studying Shakespeare, Dickens, Hardy and a miscellaneous lot of classic prose and poetry more than counterbalances any attempt in the right direction. It is true that the University has now offered Honours Schools in English and some other Arts subjects covering three years instead of two. It means that those who go in for the Honours School in English are an abler lot who are keenly interested in the study of the English Literature. It is not too much to ask that suitable provision should be made for those also who take up the ordinary pass course. By not choosing the Honours course they have distinctly shown that they have neither the time nor the energy nor aptitude to read literature. Why we should then offer them literature and literature alone is beyond my comprehension. It is high time that scholars and educationists who take it upon themselves to shape the educational destinies of this province studied these conditions in the light of the past experience and set matters right.

I have again and again referred to the teaching of English in schools and have indicated what our teachers should aim at—more of oral composition and an attempt to teach correct English, expression and usages by a thorough and systematic

drill in the shape of questions and answers, that he should give his boys as many opportunities to read and speak English as he can and insist on accuracy in both. No effort in this direction will be wasted. I have said all this, but many others have said all this and more before now. And yet we are where we were. At any rate any movement and change have not been perceptible. It is no use saying again and again what is good until we are in a position to try it. If we cannot, better give up the question. My belief is that for the proper teaching of the English language and founding a firm basis for future instruction all teachers of language should be phonetically trained and no one should be permitted to teach English until he has passed a certain good test of his own familiarity with the English language. A start might be made with a few schools and results judged after a number of years. The experiment is bound to be costly as we shall have to employ more highly-paid teachers whose primary business would be to teach English. At present the same teacher handles a number of subjects particularly in the earlier classes. One who is able to teach English properly may be qualified to teach Science or Mathematics too, but one who is qualified to teach Mathematics may not necessarily be, and often is not, a good teacher of English. And yet he is often entrusted with this work. I may say that I am fully alive to all the practical difficulties that come in the way. But our present purpose is to consider how we can improve the teaching of English in this province. It is true that the properly qualified teachers would be better paid, but it would be their just due. Any English teacher of that variety should always be considered separately, as we cannot have them here, there and everywhere.

As the years advance, every subject of study at school demands more and more attention sometimes of a specialized type, and with the growth of education and the yearly increasing number of schools it will become more and more difficult for Inspectors of Schools to supervise the actual teaching of all these subjects on proper lines. Talking particularly of English, I think that in the coming years it will become necessary to appoint a special Inspector or Inspectors to organize, control and superintend the work of English teaching on lines that I have indicated. It would certainly take any one a fair amount of time to judge whether a particular class has been working on right lines during the past six months. And there are six classes to be dealt with like this. How can an Inspector's stay of two or three days or less leave him enough time to inspect all this work in English, leave aside other subjects, and administrative work and private interviews and sundry engagements like scout shows, etc.

Again let every school have an English Board of its own, comprising all the teachers of English and let that board meet

fairly often to discuss such matters as relate to the teaching of English and to evolve practical schemes to meet practical difficulties. We shall thus have brought into play a body that would possibly be moving rather than remaining stationary and with guidance from above and impetus from below we may get a concerted action that will ameliorate the conditions of teaching and make things more satisfactory than they have hitherto been.

It is possible I may have said a few things to which some gentlemen have taken exception and from which they differ. I shall be glad if they do differ so, for out of difference of opinion comes progress. The one point on which all will agree is that whatever is generally considered to be the right course of action should be adopted, so that we may be able to test our views by the light of experience.

DEVELOPMENT OF COMMUNICATIONS IN THE PUNJAB.

By K. MITCHELL, Esq.,

Public Works Department.

1. There is no need to remind you of the essential part played by communications in civilisation. Not only do they render possible one of the three fundamentals of civilised life, that is, production, *transportation* and consumption, but they stimulate the habit of travel, promote education and national as opposed to parochial thinking, go far to prevent crime and render possible the mobilisation of resources for defence against the invader.

2. Communications may now be by land, by water and by air. At present the use of aerial communications in the Punjab is of limited application. As regards water, the cold weather supply of the Punjab rivers is more useful on the fields in the form of irrigation than in the rivers for the purposes of navigation; and the Irrigation Engineers of the Province have so effectively tapped the resources of the rivers that for many months in the year practically none except the Indus will now have sufficient water for the purpose of inland water transport which has practically died out.

3. There remain communications by land and these divide themselves into railways and roads. To turn for a minute to ancient history, about A. D. 1000 two trade routes entered the Punjab from Central Asia, one ran from Dera Ghazi Khan to Multan, Pakpattan and thence to Delhi, the other ran from Dera Ismail Khan to Mankhira and Shorkot joining the former at Pakpattan. About A.D. 1450 Sher Shah Suri started to develop the communications of his kingdom, and built two great roads which were of course unmetalled. One from the Sunargaon on the coast of Bengal to Rohtas, and one from Lahore to

Multan through what is now known as the Nili Bar which was then fertilised by the Beas, has since become a barren desert, and is now being brought under irrigation from the Sutlej Valley canals. To quote from a paper read by Mr. W. S. Dorman before the Punjab Engineering Congress in 1919 : " Along these roads he built serais, two kos apart, each with its separate accommodation for Hindus and Mohammadans, with pots full of drinking water at the gate, and Brahmins to provide hot and cold water, beds and food, for Hindu travellers, and grain for their horses, all at Government expense. Each serai had also a well and mosque with an *Imam* and a *Muazzin*, while two horses were kept ready for the royal couriers. He also caused fruit trees to be planted along both sides of his highway, and though fifty years later the author of *Muntakhab-ut-Tawarikh* was able to appreciate the amenities provided by Sher Shah, all trace of his work has long since vanished. The serais were probably built only of mud, as Sher Shah contemplated rebuilding some of them in brick as protection to the highway."

4. Further improvements were carried out later by Jahangir and to quote again from Mr. Dorman's paper, " Jahangir in his memoirs relates that one of his first acts was to dig wells and build serais on all lonely roads where robberies took place, while he forbade the levy of cesses and river tolls (*tamga* and *mir bahri*) which various jagirdars had imposed for their own profit. He also abolished all transit dues (*sair jihat*) in Kabul. According to Major Price's translation of the '*Toozuk-e-Iehangeer*;' (1820), the emperor caused the different zemindars on the route to plant at every town, village and halting place between Lahore and Agra ' mulberry and other broad-leaved trees so that the weary traveller might find under their shadow repose and shelter from the scorching rays of the sun'. Jahangir, evidently profiting by the lesson of the short life of Sher Shah's work, ordered spacious and substantial serais of bricks or stone to be built eight kos apart, which should be secure against early decay, while laths and a tank of fresh water were to be installed in each, with attendants to keep them clean. The same version adds that at the passage of every river, whether large or small, a convenient bridge was erected. In the portion of the royal memoirs dealing with the fourteenth year of his reign (A.D. 1618), Jahangir mentions how trees had already been planted on both sides of the road from Agra to Attock, and that he then ordered the construction of a line of kos minars from Agra to Lahore, and also a well every three kos. These kos minars 20—30 feet high, may still be seen about 2½ miles apart, closely following the line of the Muttra-Delhi road in this province from Hodal, through Palwal, Ballabgarh, and Tughlakabad to Delhi, after which there is a gap of nearly 20 miles before the line is again taken up at Narela, half way between Delhi and Sonapat, whence it follows the railway through the latter place to Panipat, after

which it zigzags across the Grand Trunk Road to Karnal before again crossing to the west of the railway, and passing Taraori and Thanesar goes straight to Shahabad. West of Ambala, the line crosses to the north of the road and railway and runs straight to Sirhand. From Khanna to Doraha the pillars are on the south of the road, and from Ludhiana through Phillour there is a gap in the line to within five miles of Nurmahal, whence the pillars closely follow the district road through Nakodar and Sultanpur towards the Beas, after which the only *minars* are a couple near Amritsar, and four in the Lahore District, of which the last is near Lahore on the road to Shalimar. This was the route followed by Jahangir when he set out in pursuit of Khusrao, when apparently there was a bridge of sorts over the Beas at Jobindwal."

5. Although these roads constructed by the Moghuls were used and intended primarily for the use of the Emperor and his army, yet it must be remembered that few, if any, of the large army which accompanied the Emperor on the march could ever travel actually along the road, which must have been little more than a centre direction line for the line of advance. For instance, we are told that Aurangzeb was accompanied on the march by an army and camp followers amounting to 300,000 to 400,000 people while from the description of Nadir Shah's march to Delhi it appears that his front was probably 3 miles wide.

6. During the troublous time following the decline of the Moghul Power roads fell into decay and continued to decay up to the time of the annexation of the Punjab by the British, which was followed by the construction of the Grand Trunk Road from Lahore to Peshawar, a road from Lahore to Multan, one to Ferozepur, and others. But before the development of the Punjab road system under British administration had proceeded very far, railway construction commenced and roads were comparatively neglected. On February 8th, 1859, Sir John Lawrence cut the first sod of the Amritsar-Multan railway which was opened up to Lahore three years and up to Multan six years later. From then up to the time of the great war, the development of railways and the neglect of roads continued. The war showed the weakness of country depending entirely on its railway system, while the development of mechanical road transport created fresh demand for roads, and it was then realised that roads and railways were mutually interdependent and that their development should be co-ordinated. This was provided for in the Punjab by the creation in 1920 of the Communications Board.

7. It is now apparent that a very different relation between road and railway communications will exist in the future. Good roads are necessary *inter alia* to enable the cultivator to market his produce; to enable people to reach the railway and as an insurance against paralysis of the country by a railway strike. It

is also becoming apparent that mechanical transport can and will in future more and more compete with railways for the carriage of short distance passenger traffic, as a far more frequent, rapid and convenient service can be provided for a short distance by this means of transport than by a railway. At the same time more railways are needed to facilitate the movement of the surplus agricultural crops and to bring market towns, which can only be situated on a railway, within reasonable reach of the cultivator. During the period immediately following the war the enormous rise in prices and wages and the resulting increased cost of construction and operating railways, rendered temporarily impossible the construction of any more railways in the Province ; but conditions have since materially improved and the provision of new railways is now possible and an extensive programme has been framed. The Shahdara-Narowal railway has just been opened. The Amritsar-Narowal, the Kangra Valley, Lyallpur-Jaranwala, Panipat-Rohtak, Chak Jhumra-Chiniot and Zaffarwal-Jessar railways are in the course of construction, and many others are under investigation, and it can safely be said that during the next few years no railway will be left unbuilt which can be justified financially ; that is to say which can be expected to earn sufficient to pay interest on the capital which has to be raised to build it.

8. As regards roads, the position when the Communications Board came into existence was that the Grand Trunk Road from Delhi to Attock and one or two other roads were maintained by Government in the Public Works Department, all other roads being in charge of District Boards. This system threw too heavy a burden both technical and financial upon District Boards, and neglected districts which had been developed by canal irrigation. Accordingly the Communications Board reclassified the roads of the Province in the following manner. The roads were divided into three classes : (1) Arterial, (2) Main, (3) Other. Arterial roads are a charge on provincial revenues, and with respect to main roads District Boards receive grants-in aid from the Communications Board for their maintenance and development. The number of arterial roads was considerably increased so that now every district headquarters and practically all important towns are served by an arterial road. This means not only considerable relief to District Boards in the matter of maintenance but that some 1,750 miles of unmetalled roads which have recently been taken over by the Public Works Department will be metalled as funds permit, the present programme aiming at metalling this length in about 15 years.

9. With the system of grants-in aid for main roads to District Boards has been coupled a certain measure of technical and financial supervision, to ensure firstly, that District Boards secure the maximum benefit from the money expended and, secondly, that grants-in-aid are applied to the purpose for which they are given.

10. While District Boards will be assisted when necessary with funds for the metalling of more main roads, it is their primary duty to remove the glaring defects in and maintain properly the unmetalled roads of the province amounting to about 20,000 miles which are in their charge. This is a duty which they have in the past neglected, partly from lack of funds and partly from lack of knowledge as to how to deal with the matter. Considerable assistance is now being given them in the matter of funds and the Communications Board is in addition engaged in a programme of putting and maintaining about 10 miles of unmetalled road in each district in good order both as an experiment for its own information and as a demonstration to the District Board concerned. As an instance of what can be done may be mentioned that the unmetalled road from Gujranwala to Naushera which previously carried nothing but pack traffic has recently been improved and is being maintained by the Communications Board. Almost before the improvement of this road was complete the cultivator began to market his produce in carts instead of on donkeys, a passenger service of tumtums commenced to run regularly, and finally a service of Ford lorries for the carriage of passengers is now plying between Gujranwala and Naushera. This road is apt to be cut up at certain seasons of the year, will of course be dusty and bumpy, but a motor car can usually be driven along it at a speed of 15 to 20 miles an hour, and it will never be impassable. When it is considered that some 10 or 15 miles of road can be improved and maintained in this manner for the same expenditure of money as is required by one mile of metalled road, it will be admitted that, save in exceptional cases the improvement and proper maintenance of unmetalled roads by District Boards should be their first duty before they commence any substantial expansion of metalled roads.

11. There is one point which I particularly want to bring to your notice as it cannot be too widely realised ; and that is the attitude of public towards its roads. Roads are the property of the public which pays for them, and not of an omnipotent Government with a bottomless purse. The Punjab road user enjoys at present a freedom in the use of roads which is almost unique throughout the civilised world in other countries ; there are many restrictions as to the loads which may be carried on carts, the widths of tyres, and so forth ; but in the Punjab, with the exception of very slight restrictions on the use of mechanical transport, anybody may take on to the road any vehicle which he likes. The time will come when the general public will realise what they are paying for this privilege. It is an undeniable fact that many of the bullock carts using our roads carry excessive loads on narrow tyres, and, with badly constructed wheels, are necessarily destructive of roads and specially of metalled roads. If by the introduction of certain restrictions the life of the surface of a metalled road can be increased say from five

years to six, it follows that for the same expenditure of funds the public can have six miles of metalled road for every five miles now in existence. The time will come sooner or later when the public will realise this fact and will willingly agree to the imposition of the necessary restrictions ; the sooner it comes the better and I would ask you to remember this important fact that the roads are the property of the public and that it lies with the public to see they are economically used and not abused

NOTES ON THE TEACHING OF HISTORY.

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In these few short notes I desire to state what I believe to be defective in the History teaching in our High Schools at present. My observations are based on a series of visits paid to High Schools in the Lahore Division.

My first criticism is that there was no effort to teach such Geography as might be relative to the period of History being studied by the boys. Maps were few and were, for the most part, hung up so high that they could not be consulted at all. A History lesson given without a map is, in my opinion, utterly valueless. To take a concrete instance. A lesson on Alexander's invasion *must* be illustrated by a map and if the teacher knows his business he will refer to the other invasions of India and drive home the point in the minds of his scholars, by a description of the frontiers and the various passes through which invasion of India is possible. Alexander, Mahmud of Ghazni, Babur, etc., are then brought together in the common association of invaders. It is not sufficient to indicate features on the teacher's own map. Every boy at any rate in the higher classes should have his own atlas and follow the teacher's indications on it.

Time Charts.—These are almost completely absent. They are of great value and recognized as necessary in most modern schools. Every High School should possess some and they should be comparative. It is many years since I left school, but I can remember some of the charts that hung in my class rooms and the dates and facts displayed thereon have impressed themselves very clearly on my memory.

The History lesson, if properly taught, should be one of the most interesting in a boy's day and it is the teacher's business to make it so. What I saw did not impress me. I heard one teacher give a so-called lesson on Shivaji. This had evidently been prepared for my benefit. It consisted of a long monologue which had been learnt by the class, for when the teacher stopped for a moment one of the boys went on with the tale.

To make the lesson interesting the matter should be set forth in a comparative form. It is no good treating the history of India as a detached episode in World History, with no connection or possible comparison with that of other countries.

Let me illustrate what I mean from some lessons that I heard given. The teacher was talking of Domesday Book. I pointed out to him that Punjabi boys would understand far better what Domesday Book was if he compared it with the Summary Settlement of the Punjab in 1849. The parallel is striking [This can be elaborated and land holding in mediaeval England compared with that of the Punjab even down to place names, *e.g.*, the common origin of names like Pind Dadan Khan and, say Nottingham, should be noticed.]

Another was teaching his class about the First Afghan War. But he treated it entirely as an Indian episode and failed to connect it with Anglo-Russian relations in the Near East or to make any comparison between events in 1842 and 1878.

Another was talking of Lord Lytton's Darbar. It never occurred to him to refer to the other Darbars and to contrast them. The comparative treatment of the subject lifts History from a mere soulless enumeration of facts and dates into something really worth learning. As I often tell my own students. Any episode in History should be considered from three points. Why did it happen? What happened? What was the result? One and three are by far the most important. The teachers that I have seen cling to the second as a sheet-anchor and are content with the dry bones of facts—a tasteless diet at the best of times and one not calculated to keep boys interested. □

MATRICULATION HISTORY.

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The object of the present paper is to consider the proper scope of a school course in History in the Punjab. We are beset from the beginning by two difficulties. The first is the magnitude of the subject to be taught. Even in England it is difficult to teach with any thoroughness more than a period of English History, and almost impossible to give to the average school-boy any real comprehension of History in the wider sense. And in India we feel that, while a knowledge of Indian History is obviously necessary, it is also necessary to teach something of English History, while in recent years we have come to recognise the desirability of imparting also some elementary ideas of Civics. Yet the whole of this forms a subject to which only some two periods per week can, as a rule, be allotted in the time-table. In the

second place, we are dealing with comparatively immature minds. The average boy in a school in the Punjab has so few opportunities of visualising things outside the ordinary experiences of his life that it is extremely difficult for him to gain any intelligent comprehension of the events of any period in England, or to follow speculations on constitutional or economic questions. It would seem, therefore, that we must be content with little more than a general impression, a sufficiently vivid outline, into which the details can be filled later on, as a larger share of time becomes available, and as the student's mind develops.

2. How is this object to be attained? The first step is to provide a series of impressions in the child's mind, which may serve as pegs, as it were, on which to hang the whole fabric. These impressions should be either of personalities or of great movements, preferably the former, since a personality—especially a personality in action—is most likely to form a vivid picture in the child's imagination. We should begin then, with a series of stories, and be content to leave continuous history until a comparatively late stage, perhaps the VIIth class of an Indian school.

3. This method is already in use in European schools in the Punjab, and experience in those schools points to the need of two important cautions. First is the danger that a number of disconnected stories may confuse the child's sense of historical time, and he may picture, say Julius Caesar and Napoleon, as living at approximately the same date. In order to avoid this the stories must be very carefully chosen and as carefully arranged. It will probably be best to begin with a group of the most outstanding and appealing characters in history, and to arrange them chronologically. Each of these will serve as a centre for stories contained in the succeeding groups which we shall have to add as the course proceeds, and finally each, with its satellites, will fit into a line of time when we reach the stage of continuous history. And this brings us to our second caution. It is essential, before we pass on to continuous history, to make sure that the previous knowledge has arranged itself in the right order and in the correct perspective.

4. It is obvious that in the early stages of such a course as is here suggested pictures will be of the greatest value, but even in the later stages it is difficult to overestimate their usefulness. History is a subject which must be visualised, and a picture is even more useful for this purpose than a diagram, a map or a genealogical tree. It would be well if the bare or motto-bespattered-walls of our class rooms could be covered with suitable pictures; failing this we can use well-illustrated text-books.

5. A further resource is to draw upon our courses in literature for illustrations and amplifications of the history lesson. The tradition that subjects should remain water-tight compartments dies hard—one sometimes doubts whether it is dying at

all, and many of our teachers have still to realise that there is hardly any subject which may not assist the historian. Literature, however, is one of the most important.

6. There are two points in which our method must be applied somewhat differently to Indian and to English history. Scientific Indian history is somewhat lacking in personalities in the earlier periods, and deals rather with movements, which can only with difficulty be made interesting to children, while its picturesque period is hardly yet at an end. In English history, however, the early period, abound with picturesque personalities, while the later ones grow somewhat dull to the child's mind, which loves colour and movement. It will be well, therefore, to fix the range of our stories somewhat later in Indian than in English history. In the use of literature again, we can probably find opportunities of using Persian or Sanskrit literature to supplement the text-book on Indian history, but in Indian schools we can hardly introduce the Anglo-Saxon chronicle or the letters of Junius, since the knowledge of English is hardly sufficiently advanced to assimilate them. We must be content, therefore, with far less assistance from literature in English History.

7. We have now to consider how far Civics can be included in a school course of history in the Punjab. We are still confronted with the primary difficulties of the lack of time, and the comparatively undeveloped mind of the learner. It seems obvious, then, that we cannot hope to impart a knowledge of political science. And we must remember that the schoolboy—though perhaps less in India than elsewhere—tends to be repelled by any obvious attempt to inculcate principles of conduct. The more hopeful course will be, once more, to seize his imagination, to produce the right enthusiasm by providing him with stories of good citizenship and devotion to the public good. The names which come to one's mind in English history are those of the Earl of Shaftesbury (the 19th century one) and Florence Nightingale, and in Indian history those of Mr. Gokhale and Sir J.C. Bose. But we are not limited to English and Indian History here, and may draw upon the ancients for such stories as that of Horatius, and upon the moderns for that of Father Damien. It will be for the college student to study more scientifically the bases and the framework of the state.

8. Such a scheme as I have outlined would seem to be as much—in view of all the difficulties—as we can hope to deal with thoroughly during a school course in History, while nothing less will provide a sufficient foundation for the further study of the subject by the college student.

THE ANTIQUITIES OF LAHORE.

BY LALA RAM CHAND MANCHANDA, B.A., LL. B.,
Advocate.

Lahore, The Capital.

LAHORE has been either the capital of a kingdom or at least of great strategic and military importance during the last ten centuries. It was the capital of the Great Raja Jaipal, and it was here that at the end of the tenth century he committed an act of *Johr* when he thrice met reverses of fortune at the hands of Mahmud of Ghaznavi. When Lahore was annexed in the year 1022 A.D. and became a part of the Ghaznavids' kingdom, it became the place of great military importance. It was by the first Viceroy of Mahmud of Ghaznavi that a fort was erected by Malik Iyaz. It is very probable that the Fort occupied the same site which it occupies to-day, and round about the fort sprang up the residential houses of the officials, saints and other notables connected with the State; and the citadel and the city formed the beginnings of the modern Lahore.

The Lahore of to-day with its suburbs.

Lahore is the first city, has a population of over 2,80,000, and is also the capital of the province of the Punjab. It is here that orders affecting the destinies of a population of over 2,51,00,000 are sealed by the Executive Government; it is here that the Legislative Council forges laws affecting the weal of the Province; it is here that the highest Court of Justice finally determines the legal responsibilities and rights of the people and teaches the Punjabees the wholesome moral of submitting to the judgment of the Courts instead of resorting to the arbitration of the *lathi*, and to employ the sharp persuasive tongue of the lawyer in place of his sharp *Chhavi*; it is here again that the Punjab University lays down schemes to introduce light and learning in place of darkness and ignorance, and through a number of Arts and Science Colleges it is arranged to teach modern and classical literature and science; it is here again that medical aid and surgical skill of a very high order is made available both for man and animal. It is here again that Physicians, Surgeons, Lawyers, Engineers and Teachers are trained and fitted for their respective professions. Such a city has claims on the attention both of Lahoris and Punjabees. With these introductory remarks I will take up first some vital problems that affect the present day Lahore and then try to have a peep into its antiquities.

Its Problems.

Accommodation.—The problems of Lahore are various and complicated. To take up only one, population and house accommodation. It may be noted that there are about 30,000 houses accommodating a population of over 2,80,000 souls. On

of this about half the population lives within the city walls on an area of 558 acres, or, in other words, 258 persons per acre and in this respect Lahore is certainly one of the most congested cities of the world.

There is no room for its lateral expansion. Further vertical expansion too is impracticable as Lahore is a city of houses with narrow and unsound foundations. Five or seven-storied houses are not safe. It has already demolished the enclosing walls and rushed out to build on the Civil Station and the neighbouring fields; and with the suburbs it covers an area of about 25 square miles, and is going to be as great as, if not greater than the Lahore of Shahjahan when it was at the zenith of its glory and prosperity 'The Lahore of Great Mughals.'

Its History.

Name.—The name Lahore is traditionally connected with Loh, the elder son of Ram, as Kasur (Kushore) the sister town is connected with Kush, the younger son of Ram. This name is not peculiar to the capital of the Punjab. There is a Lahore in Afghanistan near Kabul; another in the District of Peshawar, some 8 miles from Waihend, the classical place where Alexander the Great crossed the Indus. There is another Lahore in Hindustan Proper; and a Lohar in the Mewar State of the Rajputana. The name Lahore is an abbreviation of Lohawar and the terminal 'awar' is again an abbreviation of 'awarn' and the suffix 'awarn' in Sanskrit is a synonym of Kot, Garh, Pur or Abad. So Lahore in another word signifies the same sense as Lohpur, Lohgarh and Lohkot.

It has a long most stirring history behind it. Since the beginning of the Mohammadan rule in the year 1022 A.D. it has recorded history more or less complete down to the present day, but previous to that date there is an entire absence of recorded material and one has to fall on legends and traditions. So much, however, is certain that the capital of the Brahman kings of Kabul under the pressure of the Muslim arms from Central Asia was ultimately removed by stages from Kabul to Waihend on the banks of the Indus and from there to Lohawar (Lahore) on the banks of the Ravi.

Four questions are naturally suggested in connection with the Lahore before the Ghaznavids; (i) its name, (ii) its site, (iii) its date of foundation, and (iv) who was its founder.

I will not make an attempt to answer all these four questions this morning but only one, viz., the site of Hindu Lahore.

Site.

It is generally believed that Hindu Lahore was destroyed by Mahmud of Ghaznavi in the year 1022 A.D. when the forces of Raja Tarlochanpal, the grandson of Great Raja Jaipal unsuccessfully fought for 6 days and the Raja left the field. It is said that the Raja led the army and fought for three days and then fled and the Rajaless people of Lahore continued the resistance for three days more when the doors of the city were forced open and the city subjected to a merciless ransack and slaughter. It is a historical fact that Mahmud was a notorious iconoclast and the obliterator of Hindu temples. The task before me is to show the site of the city that was destroyed by the conqueror.

Tradition.

Mohammadan tradition points to the fact that the Lahore of to-day was miraculously erected in the course of a single night by Malik Iyaz the friend and the Governor-General of Mahmud of Ghaznavi. The Hindu tradition at the same time also points to the fact that their city of Lahore existed in the direction of *Bhairon Ka Asthan* which is situated between Lahore and the village Ichhra.

It may be noted that Lahore has been conspicuous for the absence of architectural remains of the Hindu period.

It is very probable that the Mohammadan conqueror would not condescend to occupy the luckless fort and the city which had fallen and would naturally prefer to found his cantonments and fortifications away from that place, so the probabilities are that Lahore of to-day does not occupy the same position as the Lahore of the Hindus.

The Lohari Gate.

I personally see a great significance in the name given to one of the gates of the modern city pointing towards the south and in the direction of *Bhairon Ka Asthan*. It is a fact that the word Lohar is only an abbreviation of the word Lohawar. When Al-Biruni in the first portion of the 11th century wrote his book 'Al'hind' he found that the city was known as Lohawar. It appears, still later, it was popularly known as Lohar, just as Shahjahanabad a gate that pointed towards Hindu Delhi was called Delhi Darwaza, so in Lahore the gate that pointed towards Hindu Lahore was called Lohari Darwaza. Even when the name of Shahjahanabad dropped out of use and yielded place to the old Hindu name Delhi, the name Delhi Darwaza still persisted and even to-day we find the anomalous name Delhi Darwaza in the city of Delhi still existing, although when the name of the modern city was Shahjahanabad there was a real sense in the name given to one of its gates as

Delhi Darwaza as pointing towards the Hindu Delhi which still existed in a tottering condition. Similarly the name given to one of the gates of the modern city of Lahore had real significance as it pointed towards the direction of the Hindu Lohar. This supplied me with a piece of suggestive evidence and I began to make a careful search for the ruins of the Hindu city towards the south of the Lohari Darwaza.

The Mounds.

I found extensive mounds lying towards the south-west of the Lohari Darwaza known as 'Miani Sahib.' These extensive mounds are used for burial purposes by the Mohammadans of Lahore and Mozang. There were strong reasons to believe that these mounds contained the tomb of Hindu Lohar.

A very careful and patient examination of the structure of the mound revealed the fact that it is an artificial heap of earth with levels of ashes, charcoal, pottery and rubbish. I have absolutely no doubt that this is an artificial mound that arose in the course of centuries by the gradual accumulations of rubbish and debris. Fortunately the mound has been excavated by coolies and exposed to view and the nature of the material can be very well studied.

The Unique Finds.

I have entertained a strong belief since 1918 that this mound at present occupied by a graveyard contained the heaps of the ruins of the Hindu Lohar. I continued for a course of about 9 years to stroll into the 'silent city of the dead' in quest of some tangible piece of evidence in support of my theory. Nothing material came to hand. I did not know the art of being in communion with the generous dead; though I was always welcomed by them I could not get any useful information out of them. I had already discoursed on this theme several times when the Historical Society of the Islamia College kindly gave me an invitation to discourse on the antiquities of Lahore on the evening of the 25th of February 1926 in the Habiba Hall. I gladly responded to the call and on the morning of the 21st February in company with my friend Mr. J. N. Bhandari once more went into the centre of the graveyard when I laid my hands on two valuable sculptures quite by a chance. Just a little beyond the excavated portion stands the building known as Chilla Chiragh Shah which is occupied by his descendants for residential purposes and as the custodian of his *Mizar* which is visited and worshipped by the *Murids*. A portion of the mound was levelled for gardening when it was discovered that there lay buried a well with brick walls. When digging out the bricks to a depth of about fifty feet, the spade fell on a stone sculpture with an image of Shivji, Parhati, Ganesh and a tiger, all in one piece, intact and uninjured and the other a terra-cotta mould of Durga. The same with

the courtesy of the descendants of Sayyad Chiragh Shah were made over to me and have since been made over to the Archaeological Department and have found a niche in the Central Museum, Lahore, in the sculpture gallery.

These finds have been declared to be of unique value and they thoroughly confirm my theory that this place contains the ruins of a Hindu city. It further shows that these images of Hindu gods and goddesses were thrown into a well in a moment of panic when the 'Idol Breaker' had vanquished the Hindus and it was feared that he would destroy these images. This image of the great god Shiva with his family lay in these dark regions for over nine centuries when it saw the light of day again.

There is a further fact pointing in the same direction. This mound was once occupied by the great scholars of Islam where they established Colleges for the teaching of Theology, Science and Medicine, and one of them, Tahr Bandagi, had a wide reputation for his great scholarship and sanctity. It is believed that the mound was occupied as a Mohallah by these great scholars who are popularly called 'Mianas', hence this place came to be known as Mohallah Miana or Miana Sharif and at present Miani Sahib on account of the sanctity of great scholars and is believed that it was one of the flourishing and prosperous suburbs of Lahore during the time of Jahangir, Shahjahan and Aurangzeb. It is noted by late Rai Bahadur Kanhaya Lal in his history of Lahore, "This mound was known as Punj-Dhera (FIVE HEAPS) before it was occupied by the Mianas.

Decline and Depopulation.

With the decline of the Mughal Empire, Lahore was in the grip of anarchy and organised bands of robbers put to the sword the inhabitants of these Mohallas and took away what was worth taking including the door-frames and rafters of the roofs. In the year 1664 A.D., Bernier noticed, "The houses had begun to look dilapidated and the long busy streets of the city to be disfigured with ruins." And when Ranjit Singh occupied it in 1799 A.D., "The ruins of Lahore afforded a melancholy picture of fallen splendour. Here the lofty dwellings and *Masjids* which, 50 years ago, raised their tops to the sky in pride were crumbling with dust, and hardly any human beings were to be seen among the ruins; all was silence, solitude and gloom." And in the year 1852 A.D., Sir John Lawrence wrote, "The vicinity of Lahore covers an area of several square miles over which extend the ruins of not one but of several successive cities of various eras and various dynasties. The surface of this extraordinary plain is diversified by mounds, kilns, bricks, stones, broken masses of masonry, decaying structures, hollows, excavations and all the debris of habitations that have passed away."

Such in outline is the pathetic tale of decay of 'the Lahore of the Great Mughals.' Its Hindu past has left no land marks as it was entirely obliterated. The hand both of time and vandal made a common cause to leave no trace of it behind. However in response to a desire to build the missing chapter of the history of Lahore, I have been able to present to you slides of the two unique finds of great archaeological value which confirm my belief and enable me to answer the question as to where the site of Hindu Lahore is.

Ladies and gentlemen, it is for you to take up this theme and other questions proposed, in a scientific spirit of patient research and careful investigation and successfully add the missing chapter to the History of Lahore. It will be then, that you will be able to solve the complicated problems of Lahore 'the city we live in.' Let us live through the Past, by the Present, and into the Future.

Wazir Khan's Life Story.

Let me now contribute a little amusement as an auxiliary to the dry discourse and tell you the life story of Wazir Khan, the founder of the Great Mosque known as *Wazir Khan Ki Masjid*. In the reign of Jahangir there lived in the town of Chiniot on the eastern bank of Chenab a poor man called Ilm-ud-Din Insari. In his youth he picked up the art of reading, writing and some knowledge of medicine and skill in surgery. The poor man found no scope in his native village, and in order to make a living as a *Hakim*, he thought of starting a practice in Lahore. One day bidding good-bye to his native village he set out on a journey through the Sandal-Bar on his way to Lahore. Lahore too had no patronage for him, he met with great disappointment and thought of going to Delhi. In Delhi he met the same fate and went onward to Agra where he was introduced to Shahzada Khurm who entrusted him with the treatment of his Queen mother, and succeeded in getting her cured. This gave him a name and fame.

In the meanwhile the great Empress Nurjahan (The Light of the World) was suffering from a troublesome boil on the sole of her foot which refused to yield to the skill of the imperial physicians and surgeons and made the Royal family feel uneasy when Prince Khurm recommended Ilm-ud-Din to his royal father Jahangir. This man knowing that medicine had failed and the imperial patient had declined to submit to the use of the knife, thought of an ingenious plan. When all the resources of the mighty Empire of Great Mughals were found to be of no avail and the great imperial physicians and surgeons had cast their heads down with helplessness, this humble man was the last to be tried. He thought of making an incision with a knife without the patient knowing it. He made the patient walk barefooted on sand spread in the palace. Coming from a part of the country where tracking was a familiar art he fixed the exact position of the boil.

hid a fine little knife in the sands in such a position as to cause only a little prick. He thereupon asked the imperial patient to carefully walk over the footprints. In doing so the boil was lanced and burst and afforded instantaneous relief.

It pleased His Majesty the Emperor who gave him presents worth one lakh *Khilat* and seven lakhs cash. It pleased Her Majesty the Empress who parted with all the jewellery she had on her person to him and her eleven fair attendants also followed her example. Thus by this successful minor operation a fortune of 22 lakhs rained on this humble man and raised him to the position of an imperial physician and surgeon, and the charge of the imperial household and kitchen was made over to him.

When Shahzada Khurm was imprisoned in order to get rid of a troublesome rival for the throne against his brother, he was placed in custody of this very man. He helped the Shahzada to run away to the Deccan in recognition of what the Shahzada had done for him. He thus saved his life and the chance to come to the throne on the death of his father. In 1627 he crowned himself at Agra and with the help of his father-in-law Asaf Jah the great Prime Minister he became the Emperor of India under the title of Shahjahan.

Hakim Ilm-ud-Din was given the official title 'Wazir Khan' and was made the Governor of Lahore. He gave to the city of Lahore that unique and glorious edifice known as *Wazir Khan Ki Masjid*, which is one of the greatest sights of Lahore. He also laid the foundations of a superb edifice known as the *Baradari* of Wazir Khan and surrounded the *Baradari* with a garden of choicest date palms and called it *Nakhliya Bagh*. At present this *Baradari* is serving a great and useful purpose where about a hundred thousand books are shelved and is known as the Punjab Public Library. The building of the University Hall, of the Central Museum, of the Mayo School of Arts, of the Town Hall, the Robert's Club, National Bank of India and the Public Works Offices, at present occupy the site of the *Nakhliya* gardens. The remnants of the ancient date trees still exist here and there singly or in clumps with their feathery leaves nodding in all directions.

This great man who rose to greatness verily from the dust, benefited Lahore by two other buildings, (i) The *Pari Mahal* inside *Shahalmi Gate* which he used as his *Katchery* and the other his residential palace close to the *Taxali Gate* with a mosque. The palace has been obliterated but the traces of it and the mosque which was known as *Wazir Khan Di Chhoti Masjid* are still there in the locality known as *Malahan Di Thatti* between the *Taxali* and the *Bhati Gate*. Such is the life-story of a humble man who by sheer luck rose to the very highest position opened by a Punjabee under the Great Mughals.

THE VALUE OF LOCAL HISTORY.

BY PANDIT SIRI RAM,

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Of all the subjects forming part of our curriculum of studies in the secondary department history is undoubtedly the most interesting. Yet judging from certain signs it seems that the boys in our high schools do not like it over much. For most persons history is associated with a dry-as-dust chronicle of events to be learnt by rote and to be taught without method. Of course those good old days have disappeared when a very competent headmaster of a vernacular middle school after experimenting just once with the teaching of the subject would end by exclaiming that he thought there was no use in his teaching the subject and the students might better learn it themselves. No doubt we tried to learn it by ourselves because we also had come to the same conclusion. He had added just nothing to the two reigns we had been reading, though he very obligingly informed us that it was during the viceroyalty of Lord Lytton that he had passed his primary examination and during the viceroyalty of Lord Ripon that he had passed through the training college. Yet though much progress has been made the prospects of history teaching are still not very reassuring. Like the truths of mathematical principles history never changes. Year in and year out it is the old drudgers of the history of England and of India. Day in and day out those old questions of the Fall of the Moghal Empire and the rise of the British in the East tax the students' brain but seem to leave the teacher cold. It is a routine business. There is no change in the subjects prescribed, there are no perplexing problems to make you think and measure yourself as in Mathematics. Not only no attempt is made to correlate history with the surroundings of a boy, but it is generally thought impracticable to make such an attempt. This dull routine enfeebles the powers even of those who can and do sometimes think for themselves and the result is stagnation if not worse.

Of course the present not very creditable state of things can be traced to various causes. And, as naturally, its remedies are many and different. I think that a very effective remedy for raising the teaching of history out of the mere dull routine that it is in now lies in the teachers realising the value of local history.

At present the subject lacks any but examination value and it is exactly here that local history comes in to brighten our study of our part. References to local history help both in a better presentation of facts as well as in a more intelligent grouping thereon. History and particularly the history of one's own country becomes all the more interesting if an attempt is made to correlate the story of our part to a boy's surroundings. More than that,

properly handled, local history would fill the same place in the teaching of the subject which is now occupied by practical work in physics and chemistry. It would also provide the teacher with a stimulant by means of which he can be made to think of his subject more respectfully.

Let us take these things in order. Local history I claim can make history teaching more interesting. The correlation of certain facts about boys' surroundings with general and broad movements of history serve two useful purposes. A student is made to realise by such correlation that history is not simply a chronicle of the dead past but that it can be used for the elucidation of many perplexing problems of our days as well. The significance of his surroundings as well is better understood and the general drift of events becomes more intelligible. Let us take some concrete examples. Take the question of Akbar's religious vagaries, a problem which is difficult of presentation if we merely content ourselves with talking of the Ibadit Khana, the Famous Fatwa, the birth of the Din-i-Ilahi and its subsequent death. However learnedly a teacher may discourse on this subject he would probably end by finding that his students were mostly busy in enumerating these factors. But just imagine the effect of a reference to the famous couplet so current at Jawala Mukhi in the district of Kangra.

ننگے ننگے پیریں دیوا اکبر آیا سونے دا پتھر چڑھایا

Oftener than not a Hindu student would have heard the couplet recited by strings of pilgrims that pour into this famous shrine and it would bring back certain memories to him which may certainly invest the religious policy of Akbar with a new meaning. He may even remember some pious pilgrim, back from the shrine, telling him how he saw the gold canopy in place over the head of the famous goddess. It would tell him more effectively than anything else about Akbar's experimenting nature, his religious vagaries, and his tolerance for other religions as well. Again the sort of government or lack of government which we in the Punjab experienced soon after the death of Maharaja Ranjit Singh can be recalled to the student's memory effectively by a reference to some of the local traditions about the first and the second Sikh Wars. For example, Lahore treasures the tradition that Rani Jindan sent oil seeds instead of gunpowder to her soldiers just before an important battle. There is the tradition current at Una, District Hoshiarpur, that there the head of the Bedi family very seriously sought to prevent the crossing of the English by putting up an ordinary fence of thorny bushes across the stream Sawan. There is then the stay of Rani Jindan at Sheikhpura to be told. All these things appeal to a boy's sense of curiosity and he can remember them better and puzzle out the meaning of general currents of Indian History by their help. There are many other phases of our history which can be

better elucidated by these means. That composed mass of customs and traditions which goes by the name of the caste system can be made much more intelligible by examples drawn from the locality. It is no use telling a student at random about the social, cultural, hygienic, local or religious factors which played such an important part in the development of this system. But when he is told that Ahluwalias have developed into a separate sub-caste from the name of the village Ahluwal, when it is explained that the Vasudev subcaste among the Brahmans has Vasudev Shri Krishna as their deity, that the bifurcations of the erstwhile Kashatriyas into Rajputs and Khatri points out an important exclusion, the caste system becomes a living reality to them and they understand it much better. Again a student of the Hoshiarpur District can be made to follow the building up of our means of communications during the British period if he be told, for example, the story of the building of the road from Hoshiarpur to Una by Pandit Govind Ram of Khudin the last quarter of the XIXth century. Again Bairam's quarrel with Akbar and his subsequent wanderings in the Punjab can be made much more intelligible to a student of the Doab by telling him that he first halted at Jullundur, was pursued to Guna Chore and submitted at ^{لج} Examples can be multiplied but I think I have now made my meaning clear.

But this is not all. Local history amplifies our knowledge of general history as well. Many places have got traditions of their own which shed light on many dark corners of our history. Take the Chopriana at Jullundur. There the Samadh of Lakhdata just inside the city is associated with the legend that a forefather of the Chopras paid one lakh of rupees to Shahab-ud-Din in order to effect the release of certain prisoners. How refreshing it would be to handle the document wherein it is claimed this payment of money is entered and what fresh fields of inquiry it would open. But a very fruitful source of information is supplied by the traditions of the migration of different families from one place to another. Every family treasures up traditions of its having come from some distant place and though the reasons are not explained, they can be very well guessed.

Of course the cases of gravitation of the population from the country to the cities is intelligible. But when it is otherwise, when a family of influence and position leaves a city and settles down in an out-of-the-way corner, there must be history behind it. The simple fact treasured up by generations of "Kanungos" for example, when they state that they left Batala, a busy town in Sikh times and settled down at Jakhera, a small sleepy village wanting even the necessaries of life, is suggestive. This migration must be associated with some particular phase of court intrigue which drove out these trusted servants of the Sikh Government. There is then the ruling house of Raipur in the

Kangra District. The family now occupies a very high position among the Rajputs of the Kangra District, but we have only to consult their genealogical tree to discover that some fifteen generations back this family was founded by a Brahmin from Southern India. Take also the family feud between Ladhu Rajputs and Vasdev Brahmins. It illustrates in a striking manner some of the wild customs of those ages when generations of successors had to do penance for the sins of their forefathers. Old grants, and firman, collections of old letters also can be made to yield much interesting and useful information. It may be said that they are not readily available everywhere. I beg to differ. Patient search would always be rewarded and there is no reason to suppose that the records of, say the Sikh times, have perished so soon. Thus family traditions, stories of migrations of the families from one place to another, stray grants of firmans of the Sikh or the Mughal times, collections of letters even of a very distant past can be used by an intelligent teacher for the purpose of amplifying the knowledge of his students.

But local history does more than that. Once it is recognized that the function of a teacher of history is not simply to repeat the oft-told story of our development in the old hackneyed tunes, the dullness of its teaching disappears. Pursuit of local history and antiquities on however humble a scale, would provide the teacher with the stimulant that he now lacks. Much can be done to brighten the dullness of the subject. Problems and exercises can be devised with profit to draw out and collect the local tradition of the neighbourhood. It is not given to every one of us to contribute much to the world's knowledge of our country's history. Yet it is possible for all of us to make this part more real and more living to ourselves at least. This research, on however humble a scale it might be, sometimes opens out unexpected views of history. There is one department of historical research where the pursuit of local history can prove immensely useful. The identification of many places mentioned in the Mughal histories remains to be done and here local knowledge is invariably useful. Only some time back I was reading the *Tabqat-i-Akbari* of Bakhshi Nizam-ud-Din, where, describing the wanderings of Bairam Khan after his return to the Punjab from the Gujrat with a view to disturb the peace of the country, Bakhshi Nizam-ud-Din mentioned the village of گنا چور. The name had puzzled Sir Eliot, and he had failed to identify the place. Some thought suggested it to me that it was گنا چور in the Hoshiarpur district. It was found to be correct. It was because I had heard the name many times before. Many of us, I believe, would be able to render invaluable services to the advancement of historical studies in India, if we were to utilize our talents well. There is, then, that invaluable fund of local anecdotes and traditions which is fast disappearing. There is not much hope of any systematic attempt

at collecting all this vast material ; but it is given to us to preserve much of it by our own efforts. Let us make a determined attempt and perform our own share of the work.

Local history can thus be made to serve all the useful purposes which I indicated at the outset. It can correlate the story of the past to a boy's surroundings, give him a surer grip on the subject, amplify his knowledge and above all give him that zest in the subject which is now lacking. For the teacher it would achieve all this and more. It will help him to a more intelligible presentation of facts and more than anything else it would provide him with a work of his own which is sure to transform his whole outlook on life and his work.

SUMMARY OF A PAPER ON CATTLE.

BY CH. ABDUL HAMID KHAN, P. C. S.,

Circle Registrar, Co-operative Societies, Punjab.

There are 15,00,00,000 of cattle in India, 3,71,00,000 of which are cows. The average daily yield per cow is less than 3 seers for only 6—7 months of the year ; if India improved her cattle-breeding even up to the *lowest* standard in Europe where the Italian cow (comparatively a poor milker) gives 10 seers a day for 10 months of the year, we should *add* to the wealth of the country no less than 5,58,08,00,000 (5,580,800,000) rupees ; this loss exceeds the total land revenue of India for 15½ years. In this calculation I have excluded half the number of cows in the country which may be too young or too old or unfit for milk production ; I have also given an allowance of 50% of the milk production for the upkeep of the cows. Still greater loss is suffered through poor draught animals. In Holland cows give 17 seers daily for 10 months in the year and in some instances, in England and Denmark the figure is still higher, reaching up to 27 seers daily.

Similar good results, produced by proper breeding, are given in dairy farms in India ; for instance, a cross-breed cow at Bangalore gives 30 seers daily ; at Ferozepur, where a start was made in 1910 to improve the Sahiwal breed, the improvement in 15 years was from 2½ to 7½ seers ; this is very satisfactory when we remember that Denmark took 45 years to increase its milk yield from 4½ to 9 seers.

District Boards have introduced some bulls for breeding purposes but there are only 1,957 bulls in the whole of the Punjab, *i.e.*, 1 bull for every 1,533 cows. To maintain a good breed 1 bull to each 50 cows is required. The value of these bulls is much reduced since there is no attempt at improving the

cows, the bulls are used too freely, no record is kept of their service, no pedigree record is maintained and no one is responsible for the upkeep of the bulls.

There is no need to attempt breeds, only proper selection among indigenous cattle is required. There are good breeds such as the Dhami, Hissari, and Sahiwal breeds in the Punjab, Malvi in Central India, Amrit Mahal in Mysore, Nellore breed in Madras and the Sindhi in Sindh. The Dhami and Hissari breeds are famous as draught cattle and the Sahiwal as milkers.

The Co-operative Department in the Punjab has instituted Cattle Breeding Societies, members of which pledge themselves to use only the approved bulls with selected cows. There are 125 such societies with 2,487 members most of whom possess one cow. Results are satisfactory. Recording societies run parallel to these societies.

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CO-OPERATION AND EDUCATION.

BY KHAN BASHIR AHMAD, M.A., LL.B.,

Secretary, Punjab Co-operative Union.

INTRODUCTION.

The subject of Co-operation and Education is so vast that its exhaustive and comprehensive exposition within the allotted time seems somewhat difficult. Therefore I deem it wise to confine my discussion to the four main aspects of the question only :

1. What are the aims of Co-operation and Education and how far are they identical ?
2. How far education is essential for the success of Co-operation and what part Co-operation plays in the advancement of education ?
3. How educated persons can be induced to take part in the Co-operative Movement ?
4. What Co-operation and Education can do by working together ?

Co-operation is the new Religion of Thrift, Self-help, Self-sacrifice and Social Service. It is the religion of Unity in Multiplicity and Multiplicity in Unity. It teaches us that each one is for the good of all ; and all are for the benefit of each. Each man shall work for all and all shall work for each is its first commandment. Its cardinal virtues are thrift, integrity, self-reliance and self-surrender. It stands out for moral uplift, for honesty and for the homely virtues that count so much in the daily lives of the people.

The co-operative estimate of humanity means a new outlook on life on the individual and his relations to the family, to the community, to the nation, and to the world. The Co-operative movement is a struggle not against individuals or any class or party, but against a social system based on selfishness and working through competition. Our destiny is the Co-operative Commonwealth, which shall have for foundation sure and strong the freedom of the individual to develop himself, in peace and through industry, for service in the common good. Every man has a natural right to food, to raiment and to shelter. The Co-operative principle is that these common needs shall be satisfied, not by trading for individual profit, but by exchange for mutual benefit. 'Love thy neighbour as thyself' is the teaching of Co-operation. When man no longer lusts for private gain the barrier to right relations between men and between nations will be removed and this will lead to the establishment of economic brotherhood which Co-operation aims at. It aims at better farming, better business, better living. It stands for the freedom of the individual and aims at the material, social and moral uplift of the masses and economic emancipation of the population. It makes people better men, better citizens and better patriots. It is a national movement and its aim is the reconstruction and organisation of the country and creating true national life in the country. It leads to self-government and makes India a nation. In it lies the salvation of the Punjab, nay, the whole of India.

The entire object of true education is to make people not merely do the right things but enjoy the right things, not merely industrious but to love industry, not merely learned but to love knowledge, not merely pure but to love purity, not merely just but to hunger and thirst after justice. The end of education is to prepare us for complete living. For complete living we must know in what way to treat our mind, in what way to bring up a family, in what way to behave as citizens, in what way to utilize those sources of happiness which nature supplies, how to use our faculties to the greatest advantage of ourselves and others. Education makes us men and teaches us the methods by which we can advance our economic and moral prosperity.

Co-operation and education, then, in addition to their special objects, stand for the amelioration of the poor and have the common aim of improving the material, social and moral condition of the people.

Now let us see what part education plays in the advancement of co-operation.

It is an open secret that co-operation without education is a dead force and is doomed to failure. Education is essential for Co-operation. Co-operation cannot achieve a great success in a country where the people cannot read and write and do not learn its main principles. Its success lies in the education of the masses.

Why is it that the progress of the co-operative movement in India has been slow, at least in its beginning? Some think it is because the idea was new to the people and therefore they did not readily accept it, while others say that the people were not convinced of its potentialities and therefore were afraid of coming into its fold. But the right answer is the appalling illiteracy of the people. The greatest obstacle in the way of the co-operative movement has been and is illiteracy. A body of illiterate men, however much they may learn co-operative principles by rote, are not in a position in actual practice to translate those principles into action. They are necessarily dependent on their literate neighbours for help and guidance. Books, pamphlets, magazines, libraries, even films and slides, cannot prove of much use to the people who are illiterate. And, as pointed out by the Registrar in this year's annual report, very little is effected unless the message is orally delivered to each man. The best form of oral teaching is by song, a lesson long ago learned by the folk high schools, and rugged bards have sprung up in several districts of the Punjab who express themselves with a pungency that pricks the guilty mind.

We, then, see that the success of co-operation depends on the spread of education and it is the educated people, especially the schoolmasters, who have been responsible in many European countries for the establishment and spread of the co-operative movement. Co-operation in Roumania, an agricultural country now rapidly advancing, was practically founded by school-masters, and to-day there is scarcely a village throughout the country in which co-operation is not widely spread and it is still in many cases under the guidance of the school master.

The schoolmaster has great powers. In other countries it is the schoolmaster to whom everybody turns for help. He is the man who feels it his duty, as a servant as well as a leader of the community, to help everybody who turns to him. The school master shares and guides all local interests.

But here in the Punjab the school master has a very limited view of education and of his responsibilities and also of his powers. There are very few who study books on any other subject except their own and this narrows their outlook. The school-master has been aptly described as a nation builder. India is a country of illiterate

people and the school-master can act as a national constructor by removing illiteracy. He should take co-operation as a means of creating national life in his country. Removal of illiteracy will make the villager a good citizen and a better moral being as in Denmark, where the Folk High Schools have achieved great success in this respect. So far as the young men of the universities are concerned, the field of co-operation offers a unique opportunity. Let me remind you of the example of the university students of Finland who, when they saw their country lagging behind in the march of progress and getting economically impoverished, handed themselves for the work of co-operative organisation and did not rest content until they had organised the whole country for co-operative education, sale and distribution and thus not only saved their country from ruin but brought it back to economic prosperity and to the rank of progressive nations.

The Rural Community Councils in Scotland and the English Village Clubs Associations in England, composed of many of the most prominent leaders of public life, are making organised attempts to resuscitate the villages by the encouragement of agriculture, by inducing and providing facilities to educated men to settle down in the country in agricultural pursuits, by the spread of adult education, by the resuscitation of village industries and the creation and encouragement of new ones, by the holding of extensive lectures throughout the rural areas at various places in close conjunction with the Universities of Oxford and Cambridge, and by the systematic organisation of amusements and sports to render village life more attractive. Then, again, in Japan there are in every village voluntary agricultural associations, as also village clubs of young men engaged actively in constructive work in helping in the improvement of the village industries, agriculture and co-operation. If this work is considered necessary for the welfare of highly industrial nations like England and Japan, how much more important is it in India where village life represents a larger percentage of national resources both in men and wealth than in any other civilised country in the world and where any neglect of village life is sure to be attended with disastrous consequences to the nation ?

Fortunately for us a Rural Community Board has been established in the Punjab last year with its headquarters at Lahore and having branches in districts which are known as Rural Community Councils. The object of this Board is the enlightenment of rural and urban citizens. The agency through which this Board can work successfully is quite rightly the school-master in the town or in the village.

There is a vast field of work for this Board to perform which may be classified under the heads :—

- (1) Wealth, (2) Health, (3) Education, (4) Amusement and Recreation, (5) Settlement of petty disputes.

Here is golden opportunity for the school-master to work in close connection with the co-operative department. Let him rise to the occasion. The future of India rests with the school-masters, the destinies of the rising generations are in their hands. They should realize their vast powers and great responsibilities and toil ceaselessly in freeing India from economic and moral servitude which can only be done by co-operating with the Co-operative Department.

We have seen that education is essential to co-operation and co-operation cannot achieve great success without education. Now I will show what part co-operation plays in the advancement of education and how it can bring the educated people in its fold.

Co-operation.
Its Aid to
Education.

The Compulsory Primary Education Act has not been so readily accepted as one would have desired, not because there is no desire for education but because the compulsion comes from outside which the people abhor. A new method has been found by the co-operative department to make compulsory education more attractive by the establishment of Co-operative Compulsory Education Societies.

Compulsory
Education.

We have in the Punjab now 140 co-operative compulsory education societies with nearly 7,000 parent members and about the same number of children. Seven of these are for girls. The members of these societies are parents who pledge themselves under by-laws to send their children, boys and girls, regularly to school. The defaulters are fined not by any outside authority, but by their own committee. These societies are better than the ordinary compulsory education in this respect, that in this case compulsion comes not from outside, which is always repugnant to the people, but from inside, from the members themselves, to which they readily surrender. They have stimulated a desire for education and are making the path clear and easy for the introduction of the Compulsory Primary Education Act.

It is highly desirable that the District Boards should start schools at places where there are compulsory education societies but no schools.

One of the greatest obstacles which hampers the progress of education at the present movement is that the number of the students decrease as we go up from the first to the fourth class. Even the Compulsory Education Act has not been able to get over this difficulty. The solution lies in the organization of the co-operative compulsory education societies which can go a long way in producing the desired result.

India cannot wait for the time when her boys will be educated. She must educate her adults along with the boys if she is to derive any lasting advantage from responsible self-government, towards which she is rapidly advancing.

The screen of ignorance and illiteracy in the villages is so thick and opaque that villagers are not able to see even where their interests lie and which way they should turn for salvation. In the Punjab it was the co-operative department which realised the importance of adult education first of all and the credit of establishing the first adult schools in the Province goes to it and its example has been followed by the educational authorities. There are now 269 co-operative adult schools in the Punjab and 8 are for women. Whenever a District Board is willing to take over a co-operative school we gladly transfer it. We are not rivals; our work is that of pioneers. Here is a vast field for the educated people to serve the co-operative movement by offering their services for the teaching of the adults. The days of illiterate men is past and educators and co-operators agree that if India is to be a wise and a strong nation her men and also women must be literate and broad-minded. We find that boys lapse to illiteracy after they leave the school. This defect can be remedied by means of adult schools, evening classes and reading rooms.

India wastes a good deal of money every year in extravagant expenditure on marriages, funerals, bad customs and evil practices. She cannot become a rich country unless this wastage of money is stopped. For this purpose we have 59 Societies of better living in the Punjab with more than 2,000 members. Educated people can help these societies in two ways. They can show by their own example what better living means and they can help others in removing evil practices.

One of the causes of the poverty of the Indian peasant is litigation. Co-operation tries to stop litigation by means of Arbitration Societies in which members undertake to lay all their dispute before a Panchayat. If a member goes to a law court instead of referring his quarrel to the society for decision the committee can fine him. We hope to revive the panchayat system by means of the arbitration societies in the Punjab.

Then we have 105 unregistered school supply societies and their turn-over during the year was about Rs. 1,00,000 for the most part in stationery. These societies purchase stationery and other school material, at wholesale price and then sell them to their members—the school boys. These societies have proved of some use in spreading the co-operative idea among the school boys. The Khalsa College and the Reformatory School at Amritsar with 4 normal schools elsewhere, sold Rs. 66,500 worth of goods.

Co-operation is nothing but a combined effort to avert all forms of waste in the human affairs and to effect economy in the interest of the community and of its individual members. Thrift is both an individual and a national virtue. It is needed not only for the well-being of the individuals practising it but also for the advance of the whole community. A country's prosperity, its industries, trade and commerce all depend on the thrift of its people. An unthrifty man is his own enemy and a traitor to his country. And thrift is the proper sphere of the school-master in the co-operative movement. There are 558 thrift societies consisting mostly of school-masters in the Punjab.

All these various forms of co-operative societies—compulsory education, adult schools, better living, arbitration, supply and thrift—play an important part in the spread of education and make the educated people, especially the school-master, interested in the co-operative movement which is so very essential for its success.

The school-master can serve the co-operative movement in various ways. He can act as a secretary in an illiterate society, and can save us from the circle secretary who is a great curse to the movement; he can help the adult schools by offering his honorary services, he can work as a friend, philosopher and a guide in better living and arbitration societies. But he must acquaint himself with at least the basic principles of co-operation if he is to be of any real use. Because, as recently remarked by Lord Linlithgow, Chairman of the Royal Commission on Agriculture, in the Bombay Provincial Co-operative Conference, the greatest enemy of the co-operative movement in this country and in any other is the uninformed enthusiast and the people who think that enthusiasm and zeal can take the place of careful study and exact knowledge. They cannot.

India is a poor country though its land is rich and fertile. There are two harvests in a year, crops grow with little trouble and expense and the people are industrious. Yet their condition is miserable. A graphic account of the miserable lot of the Indian peasant has been given by His Highness the Agha Khan in his work on India in Transition. Describing the daily routine of the humdrum life of the toiling peasant in this lack-a-day world he sees the ill-clad villagers, men, women and children, thin, weakly and made old beyond their years, by a life of underfeeding and over-work, who have been astir before day-break and have partaken of a scanty meal consisting of some kind or other of coarse cold porridge, of course, without sugar or milk. With bare and hardened feet they reach their fields and immediately begin to furrow their exhausted soil, with lean cattle of a poor and hybrid breed

usually sterile and milkless. A short rest at mid-day and a handful of dried corns or beans for food is followed by a continuance till dusk of the same laborious scratching of the soil. Then they plod their weary way homeward in the chilly evening, every member of the family shaking with malaria or fatigue. A drink of water probably contaminated, the munching of a piece of hard black chapati, a little gossip round the peepul tree, and then the day ends with heavy unrefreshing sleep in dwellings, sheltering also their cattle, and so insanitary that European farmers would dread to use even as pig stys. Such is the miserable and pitiable lot of the peasant in India.

The causes of India's poverty are illiteracy, want of thrift, lack of organisation, want of self-help and self-reliance, litigation and evil customs. All these causes can be remedied by means of co-operation and education and India can become a rich and a prosperous country if her people but try.

Now let us consider the measures which should be adopted for the spread of co-operation in schools and colleges and among educated classes. We have already seen the various forms of co-operative societies which can go a long way in making educated persons interested in the co-operative movement and can induce them to join the co-operative brotherhood for their own benefit and for the benefit of the country and the nation.

In addition to these measures the system of lectures, which is the most effective method of propaganda among educated classes, has been adopted and is acted upon by the Co-operative Department from the very start of the movement. Now that the movement has reached a stage at which it must progress rapidly without much effort we should make an organised attack on the educated classes by means of lectures and win them still more to our side so that they may co-operate with us in spreading the true principles of co-operation which is so very essential for the safe progress of the movement.

It is highly desirable that co-operative lessons should be introduced in the text-books of the schools and co-operation should be included in the curriculum of the University. We have already a few books in Urdu such as 'Rafiq-i-Zamindar' written by K. B. Sh. Nur Ilahi, which contain co-operative lessons. Such books should be multiplied and introduced in schools.

If we are to induce the educated persons to take interest in the study of co-operation we should establish co-operative reading rooms with co-operative magazines, periodicals and journals. These reading rooms will prove of immense value in spreading the true principles of co-operation.

The Punjab Co-operative Union—the chief non-official co-operative democratic institution of the province—has already started vernacular libraries at the headquarters or small central banks and banking unions.

India is crying for self-government ; but democracy in the hands of illiterate and ignorant persons is a dangerous instrument. The electorates in India are illiterate and do not know how to exercise their vote. Self-government cannot be a boon to the country unless we educate the electorates and the voters in the art of self-government, and the best way of educating them is by means of co-operation. Co-operation leads to self-government and makes India a nation. A co-operative society is a true parliament.

The salvation of India lies in the spread of both co-operation and education. Co-operators are always too glad to stretch their helping hand for the spread of education and it would not be too high a hope for them to expect in return from the educated persons their ungrudging help in the advancement of Co-operation. Thus and only thus can India attain self-government and free herself from the economic, social and moral servitude and can stand shoulder to shoulder with the free nations of the world. Therefore let us rise to the occasion and gird our loins not to grudge any sacrifice, however great, for the achievement of this noble and high aim by means of co-operation and education which are twin sisters.

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WISE USE OF MONEY.

BY SARDAR LACHHMAN SINGH.

Before discussing the wise use or otherwise of money, its definition, origin and a short history seem to be necessary. There is no very general agreement upon the point as to what is meant by money but it may be defined as being an object which is widely accepted in payment for goods or in discharge of other kinds of business obligations. It is the means of payment created and enforced by the authority of the state. To trace its origin we should take ourselves back to the early primitive stages of society wherein every one was at once a buyer and a seller and business was effected by a direct transfer of commodities, or, in

other words, the barter system was in vogue. This system was one of the most inconvenient and unpractical of operations, since before barter could be successfully effected, the possessor of a commodity must not only find some one willing to acquire the object he possesses, but one able and willing to give him in return, the precise object he wants. The inconveniences attendant upon the system even in the simple conditions of primitive life led to the use of some article intrinsically valuable and not too easily perishable which could be generally accepted in exchange for things for which other men had no immediate use. Among different tribes and at different times different things such as cattle and sheep, horses, camel and oxen, furs, skins, and cowries have been used as mediums of exchange and the measure of value, Maize in Central America and olive oil in the Mediterranean region long served as currency. As late as 1732 we find the legislature of Maryland making tobacco and Indian corn legal tender. Later on, the precious metals were found to be peculiarly well fitted to serve as money in view of their many useful qualities, such as, durability, portability and homogeneity, etc., etc. Consequently they replaced the primitive forms of money. In the earliest phase they were weighed in every single transaction. With the lapse of time they were shaped into rings, discs and roughly cut pieces, but even then the scales were indispensable for those who bought and sold. The earliest coinage of money is usually attributed to the Greeks of Asia Minor. The final stage in the evolution of money is marked by the introduction of tokens, more especially substitutes in the form of pieces of paper which can represent any desired value thus facilitating the rapid payment, exchange and transport of enormous sums which is would be difficult to effect with metallic money. The first issue of paper money may be traced back to the twelfth century in the form of bills of exchange and the state issued paper money in France in the 18th century. With the development in banking the substitutes for metallic money have considerably multiplied.

After a brief survey of the meaning, origin and the early history of money, the next question that naturally comes up for consideration is, what is the point of using money, or, in other words, what are the advantages of substituting money economy. Firstly, money generalises the purchasing power of the consumer and enables him to make his claims on society in whatever form he likes best. Secondly, it enables the producer to attend exclusively to his own industry and so to add more effectively to the general flow of services and goods which constitutes the real income of society. He is saved the trouble of bartering his products for his own requirements and thus can devote time and energy to specialize his industry. Thirdly, it facilitates the making of loans and payments in advance. The commodity could also, no doubt, be loaned out to some extent but the procedure would be very cumbrous and difficult, if it is to be done on a large scale.

As mentioned above, money generalises the purchasing power of a consumer. Now it is exactly with the wrong or right use of this power that we are primarily concerned for the purposes of this paper. Every person has a responsibility as a consumer and upon the wise discharge of this obligation rests the real well-being of society. This responsibility consists in the expenditure of money on the necessities of life rather than luxuries or extravagance. It must be admitted that 'luxury' is only a relative term and it would be absurd to lay down a hard and fast rule of spending for everybody and then to say that any excess above that is luxury. Things which are luxury for persons belonging to one social stratum of society, may be a necessity for those belonging to another. It may however be defined as anything without which one can do, without impairing his health of body and mind.

This sermon of expenditure on necessities might seem to be interfering with one's freedom of action; men in possession of money may argue that they have earned it by dint of their intelligence and grit or have inherited it from their parents or guardians and consequently they have every right to spend it in whatever way they like. But a little reflection will make it clear that they have a duty to perform in return for certain facilities afforded to them by society. Consequently they cannot in justice spend money in a way which is detrimental to its interests. If the wealth is inherited he owes its peaceful possession to society and if it is self-acquired he owes it to the training given and the opportunities afforded by society. In either case he is indebted to Society for the enjoyment of his wealth.

Now the question arises as to how expenditure on extravagance and luxuries is pernicious from the view-point of society. The fact is that money spent on luxuries and extravagance increases production of those things and since the producing power of mankind is limited, the capital, energy and labour required for production of necessities are decreased to that extent. Thus every purchase of an article of luxury stiffens the price of necessities and makes the poor poorer. If we abstain from or reduce our luxurious and frivolous consumption, the production of luxuries is checked and capital and energy are set free for the production of necessities. Now if each consumer begins to realise the fact that he should spend money only on goods and services really wanted and gives up the practice of spending on luxuries and extravagance, a large saving should be effected. The next thing to be considered is what use money thus saved will be put to, because saving by itself cannot work out the economic salvation of the people; it is not the end but only the means. Three alternatives suggest themselves. Firstly, it may be hoarded but the disadvantages attendant on this are too obvious to be mentioned and no sane man can approve of this stupid practice. In the words

of Mr. Calvert "a rupee idle is a producer idle and lacs of rupees idle would make the country poor." Secondly, the savings may be given to those who are in need of money. This might temporarily increase the purchasing power of the needy and for the time being may better their lot. But this will produce a host of parasites who will always require to be spoon-fed and the spirit of enterprise so very essential for the well-being of society, will be hopelessly stifled. The last, but not the least, and in fact the most important alternate is to invest the savings either directly or indirectly in some productive industry. Money thus employed has more or less a permanent existence. It goes on making more wealth and employing more labour, increasing thereby the purchasing power of the poor and enabling them to enjoy comparatively greater comforts, whereas money that is spent on luxuries or extravagance is wasted as soon as the fleeting life of the toy that it buys is over or the momentary pleasure bought has been enjoyed. The history of advanced countries amply illustrates the fact that no economic progress is possible unless the people save and, what is still more important, put their savings to productive use.

Now coming to the conditions prevalent here in the Punjab, we see that the significance of the wise use of money is very little understood. The fact finds its demonstration in the lavish expenditure on ornaments, ceremonial occasions, festivities and litigation—which more often than not, constitutes one of the main causes of widespread distress and almost grinding poverty among the people.

Generally speaking, Nature here has been far more lavish in her bounties than in most of European countries which are considered to be some of the richest. The soil is more fertile and yield two harvests a year. It is less dependent on manure than soil of other countries and requires a very little artificial drainage. Despite these advantages, the economic position of the people is anything but satisfactory. The responsibility for this unhappy state of affairs mainly devolves upon ourselves. The resources of nature have not been exploited to the full and the soil which provides an inexhaustible source of wealth has not been made to produce the maximum it can. Whatever is obtained by our half-hearted and crude methods is not utilised well and made to do the full day's work. Most of our actions are regulated by public sentiment and conventions rather than what ought or ought not to be. The question of expenditure is no exception. We spend on certain things simply because we see our neighbours do it. The habit of sheep-like mimicry is too strong for us. The statement is clearly borne out by our expenditure on jewelry. Most of the people spend on ornaments not because they can afford it but simply because, by common usage, it has come to be considered a sign of richness. The wrong notion of prestige and honour tempts them on to ostentatious display.

It may be argued by some that jewelry is a form of investment and its existence as such could be justified when life and property were not secure but with the establishment of peace and order there seems to be no reason why this unwise and wasteful practice should continue. The money for the purpose is sometimes borrowed at exorbitant rates of interest and the article even if sold immediately after it is out of the smithy will hardly fetch $\frac{3}{4}$ ths of its original cost. "In India," says Professor Kale, "jewelry has been the average person's bank which yields no interest and does not always ensure security. As soon as a man has made a small saving he will hasten to convert it into an ornament for himself, his wife or his child." The enormous waste that results from locking up capital in this way, can be judged from the fact that in the year 1922-23, about 41 million pounds worth of precious metal or over 40 per cent. of the world's production in that year was imported and in the last 50 years the amount exceeds five hundred million pounds, a sum probably nearly sufficient to pay off the whole agricultural debt of the country." Had this amount been utilised in financing some industry, the country would have made a fair advance on the road to prosperity.

The huge expenditure on social ceremonies affords another instance of unwise use of money and is responsible for tremendous waste. Of all ceremonies, marriage furnishes an occasion for the most reckless expenditure. In most cases the money required for the purpose is borrowed and often carries alarmingly high rates of interest. With the amounts thus raised, the guests not a few in number are entertained on a sumptuous scale for days together, a host of faqirs and menials is fed and presents are exchanged: Gaudy dresses which are seldom if ever used are prepared for the bride at no small cost. To complete the whole show fireworks are displayed and bands engaged. Money is thus ruthlessly squandered in these and a hundred other ways on such occasions and more often, as soon as the heat of the moment is over the man finds himself deep into the mire of debt from which it is not always easy to extricate himself. The evil becomes all the more pernicious in view of the fact that marriages are not a few in number. Owing to early marriage no sooner is a generation settled than another springs up; there is thus an endless chain of marriages and none but the rich can stand the strain.

Next in order come the funeral ceremonies. Large amounts are spent on the funerals of aged parents and in some tribes, *e.g.*, Bagri Jats, more money is spent on such occasions than even on marriages. Personal enquiries which I was able to institute in Fazılka Sub-Division of Ferozepore District from men of this tribe some years back filled me with wonder and dismay, when I learnt that thousands of rupees, to say nothing of hundreds, were wasted on such occasions. Often the hosts as well as the guests drank to the dances of the professional girls.

These are not the only ceremonies which are responsible for and the occasions of enormous waste of money. There are betrothals, births of sons and many other occasions which witness more or less similarly lavish expenditure and leave the poor poorer.

Litigation constitutes another great source of waste. "In the years 1919-21 the number of suits filed in the Punjab average over 188,000 and the number of persons brought to trial 268,000." According to Mr. Calvert's estimate $2\frac{1}{2}$ million persons attend the courts every year in one capacity or the other and from three to four crores of rupees are annually wasted in the process. What is specially deplorable is the fact that there are no signs of decrease and that there is a complete lack of constructive efforts to check this enormous waste. Unhappily the necessity of sound economic leadership is not properly appreciated even by the educated and the exploitation of the poor and the ignorant by the interested persons is allowed to continue to the great loss of the province as a whole.

The sad tale of the various sources of waste is yet hardly complete. The ever-increasing use of intoxicating liquor adds materially to the misery. The system of money-lending in vogue encourages much improvident borrowing and incidentally improvident expenditure. The establishment of peace and order afforded facilities for the accumulation of wealth and with the increase in wealth there are now more persons with money to lend. They compete with one another in offering loans, whatever the security, in order to employ their capital. It is no concern of theirs to see to what use the borrowed money is put. The evils of facile and uncontrolled credit are aggravated by the ignorance of the people about the proper use of borrowed capital. The inevitable result is the increasing indebtedness of the people. The total agricultural debt of the Province, according to Mr. Darling's estimate, amounts to Rs. 90 crores of which the annual interest charges are Rs. 13 crores, *i. e.*, nearly three times the land revenue. This amount of debt is surely not heavy as compared with some of the Western countries. In Prussia with a population of 35 millions, landowners' debt in 1902 amounted to nearly Rs. 565 crores, yet before the War the country was as strong in agriculture as any other in the world. The difference between the two clearly illustrates the importance of wide use of money. In Prussia the amount borrowed is devoted to land improvements, whereas in the Punjab most of the debt is unproductive, only a negligible amount almost certainly less than 5 per cent. goes to improve the land.

The vicious system of money-lending thus must be replaced and the people taught the importance of saving and above all investing money in productive purposes, if the Province is to advance along the road to prosperity. To achieve the end in view no other form of organization than that of co-operation is suitable.

The Co-operative Credit Society checks improvident borrowing by advancing loans only for productive and useful purposes. It exercises vigilant watch on the application of money borrowed to the approved objects. Further, it inculcates the habit of thrift by requiring its members to contribute towards its share capital regularly. Again by accepting deposits it affords facilities to the people to invest their savings. The moral and material results achieved hitherto in this Province by these societies are simply wonderful and augur well for the future.

To check extravagant expenditure on ceremonial occasions, a potent weapon has been devised in the form of Co-operative Better-Living Societies. Each member of such a society agrees to observe under penalty of fine such reformed customs and spend such amounts on ceremonies as the general meeting may approve. The weight of the strong public opinion so created, tends to reduce the extravagant and unwise expenditure to a considerable extent. To mention a concrete example, 32 Mohammadan Rajputs of Barwa, a village in Jullundur District, could effect, by the help of such a society, within six months of its start, a saving of Rs. 5,000 nearly, which amount, according to their old customs, would have been wasted on 8 ceremonies that came off during the period. This is no small achievement and speaks volumes for the benefits likely to accrue to the people in future.

Then again there are Co-operative Arbitration Societies, the members whereof pledge themselves to settle their disputes locally instead of resorting to the courts. Frivolous litigation is considerably checked and enormous waste of time and money stopped by means of these societies. There are other miscellaneous co-operative societies, each of which aims at reducing waste or increasing income and thereby promoting prosperity among the people.

To sum up, no economic progress is possible unless the people learn and practise the wise use of money. As shown above, co-operation is the best form of organisation calculated to achieve the end in view. It is thus the bounden duty of every well-wisher of the country to do his bit to take the message of co-operation to each hearth and home.

INDUSTRIES.

By SH. MANZOOR ALI,

Inspector of Industrial Co-operative Societies.

The industries of the old days in India may be divided into two classes, rural and urban.

The village industries primarily consisted of the production of staple articles necessary for the common people, to supply the simple needs of the villagers.

By urban industry is meant the art and luxury industry of the towns.

The weaving of coarse fabrics by a weaver, the making of ordinary agricultural implements by a carpenter, and the moulding of earthen vessels for agricultural and household necessities by a potter are different forms of rural industry; while the manufacture of fine textiles, embroidery, fine gold and silver work, ivory and wood carving, the wire and tinsel industry and many other artistic handicrafts fall under the second category. Some further description of both these kinds of industries as they existed in the past and the change that has been taking place in them at different stages with special reference to co-operation is necessary.

India is, and has always been, pre-eminently an agricultural country. According to the first regular census of 1872, 56·2 per cent. of its population was found to be engaged in agriculture, while another 12·3 per cent. were agricultural labourers giving altogether 68·5 per cent of the adult male population deriving their livelihood from land. This percentage is still higher in the Punjab. Most of the rural population though engaged in industrial occupation have agriculture as a subsidiary occupation. The peasantry form the overwhelming majority of the total population which lives in the villages. The real important unit in the economic history of the old India was a village. The financial condition of the peasants on account of the difference in geographical and political situation of the villages was not the same all over. On the whole the condition of the peasants was anything but satisfactory. They were generally found to be in a depressed condition during the 18th century. The state of internal communication was extremely defective. There were hardly any roads; any such were in a most neglected condition. They were only practicable for the primitive type of carts drawn by bullocks. The rates for carriage of any agricultural produce were exorbitant. Naturally little trade was in existence. The effect of this lack of communication on export trade is evident. The best industrial products of one part of India were unknown to the other. In illustration of this Dr. Birdwood in one of his

reports in 1863 on one of the Museums of India remarked that "Koftgaree" and the exquisite stone ware of Agra were not known in Bombay until some specimens of it were sent there by the Lieutenant-Governor of the Punjab. It appears from other sources too that the art products of the north were unknown in the south. The consequences of this were an extremely limited market even for the best artistic products. Thus in the first half of the 19th century the trade of India was restricted within very small bounds. The production was meant for local consumption by the petty chieftains and courtiers in case of specialized articles. The internal trade of the country being in such a state the prices too varied at different parts. The fluctuations, especially in food-stuffs, were sudden and violent. The prices in any particular year were dependent on the condition of the crops. In famine years, before the construction of the railways or other easy means of communication, there were no local resources or means to draw upon for supply. What now is considered merely a local scarcity became a terrible famine causing deaths by starvation to hundreds of people.

The one peculiarity of this village life on account of its isolated situation was, that it was an entirely self-sufficient unit. All the main needs of the community were satisfied locally. It was only for such things as salt that recourse was had to an outside market. A writer thus describes a Punjab village in those days, "It grows its own food, makes its own implements, moulds its own domestic vessels. Its priests live within its walls. It does without a doctor and looks to the outside world for nothing more than its salt and spices" What is said of the Punjab applied almost to the rest of India. The artisans were in fact the servants of the village. Each cultivator paid a fixed portion of his each year's produce for the services rendered to him by each one of the artisans. A carpenter or a smith was required to repair and make all implements used in agriculture. Similarly the potter in return to the fixed share paid to him at each harvest, would make pots for a cultivator for his domestic and agricultural use. A weaver was an exception. Nowhere he was considered to be a village servant unless he undertook duties other than those ordained by his profession, because the services of his profession were not regularly required by all members of the village community. The occupations of the village artisans were hereditary and there was no competition from outside. Custom did not allow a cultivator to procure the goods required by him from outside although he might be able to obtain a better quality. The system, though protecting the artisan, did not increase his proficiency in the craft. But by the system the needs of the villagers, on the whole, were well served. The failure of crops or prevalence of famine affected the entire population of the village cultivators as well as artisans.

The occupation of India by the English in the later stage changed the entire outlook. The new civilisation brought by the British, resulting in improved means of communication and transport, wrought a great change in the old system. Railways were constructed. Canals were dug. Public Works Departments opened a new line of work for the people. The artisans fled to towns where they got into new spheres of activities. This all went greatly to undermine the old institution of a village community as a self-contained unit. The whole village industry was revolutionised.

Urban Industry in the Old Days.

As remarked above the urban industry in the same period (the beginning of the 19th century) was mainly in the nature of handicrafts producing fine and luxurious products for the aristocracy. The industry in the towns was well organised and had reached in many things a high water mark of excellence. Some of the products began to enjoy world-wide reputation. Before the advent of the British the quality of such goods was unknown outside the place of its production. Among the best industrial products of the country may be mentioned the calicoes of Bengal, the muslin of Dacca, silk goods of Murshidabad and Kashmir shawls produced in Kashmir, Amritsar and Nampur in the Punjab. Benares was famous for its brass and copper wares. The damascene work for ornamentation of arms was practised in Sindh and Punjab towns like Sialkot and Kotli-Loharan. Rajputana enamelled jewellery and stone carving was matchless. The marble inlaid work of Agra was no less renowned. The special characteristic of the high quality of these Indian products was that while maintaining their high artistic standard they never sacrificed utility. The chief industry of the country was the textile handicrafts. The muslin of Dacca was best known of these. The Manchester manufacturer could not produce its like. Mr. T.N. Mukerjee in his book (Hand Book of Indian products in 1883) mentions that a piece of the finest muslin 20 yards by 1 could be made to pass through a finger ring. It required 6 months for a weaver to finish this piece. Other fine cotton and silk fabrics in other parts of the country like the dhoties and dopattas of Ahmedabad and silk bordered cloth of Nagpur acquired a great fame. The woollen goods best known were the shawls produced in Kashmir, Amritsar, Ludhiana, and several other Punjab towns. These shawls became very popular in Europe especially in France where they were sent for a long time in great numbers. The Franco-German War cut off the French demand, and afterwards change in the French fashion prevented its revival. Alas, the use of aniline dyes instead of old indigenous vegetable dyes, adulteration of cheap imported material and finally the production of cheap imitation shawls, have given a fatal blow to these industries. Besides the textile industry most forms of artistic handicrafts were practised throughout the cities and capital towns of the country.

To be brief, urban industry occupied a very very favourable position in India's economic life at the beginning of the 19th century, but the middle of the same century witnessed a rapid decline all round. The decline may be attributed to several causes :—

- (a) The manufacturers of artistic goods were mainly patronised by the princes and their courtiers. The disappearance of their courts gave a rude shock to the industry.
- (b) The change in the fashion and tastes of people brought about by the British civilisation and influence.
- (c) More than anything else the competition of a more highly developed form of foreign industry.

Indian goods successfully competed with them for some time. It was only after the series of inventions that led to the application of mechanical power to manufacture on a large scale, that the English and other industrialists gained a considerable advantage over the artisans of this country. Still their deterioration is not complete. In the textile industry which is most important after agriculture there still remains in the opinion of the Indian Industrial Commission "a number of specialized types of cloth of which the slow moving Indian customs decree the use especially in case of dress for women". It is not possible for the power looms to produce at a profit these various types and specialities. This gives advantage to handloom over powerloom. The introduction of improved labour saving appliances in the textile and other industries can do a lot to improve the conditions of the Indian manufacturers. The special localised industry is still successfully beating the foreign competition. Only its system and method of work are required to be reorganised on sound co-operative lines.

The economic progress of a country is generally dependent on the simultaneous development of both its agriculture and industry. It is particularly so in the Punjab, where both are interdependent. Agriculture not only provides raw material for the local industry but also gives subsidiary occupation to a great many artisans. They are equally hit with the agriculturists in a famine year when crops fail. Agriculture therefore should be improved in the interest of artisans, while industries should be started to relieve a great burden now falling on agriculture. Development effected in the country in the way of expansion of railways and canal systems have afforded ample facilities for the improvement of its industries. The growth of big towns, introduction of electric power, and facilities in transport, indicate their sure advance. The question of labour and capital (necessary elements in industry) should receive close attention. It was a vexed question in England and other countries

when they were passing from similar circumstances. Skilled or unskilled labour is scarce in India. The former is due to the scarcity of education. The percentage of literate men in the country is exceedingly small. Industrial education should form a necessary part of the general education in all the primary and middle schools started in the industrial centres. The dearth of unskilled labour is largely due to great majority of population maintaining themselves on the production of the land, working as farm labourers in the absence of other lucrative callings. The canals and railways also absorb not a small number of this class. The result is, there are very few industrial factories in the Punjab. But more difficult than this is the accumulation of capital. The Musalmans, an uneconomical class, have little savings and are consequently less enterprising. The Hindus have employed their cash in the money-lending profession and commerce. The capitalist class far from helping the cottage or factory industry is strengthening its hold upon the manufacturers whenever they happen to lend money to them by their usurious methods. Leaving aside the factory industry it may be pointed out that labour and capital affect the cottage industries to rather a less extent. Excepting the Government activities in the improvement of cottage industries by the opening of co-operative societies among them and a few industrial schools, little if any help is rendered by any non-official body or individual in this important direction in the province. If the well-wishers of the artisan classes would lend helping hand in pushing the great co-operative movement with their money and advice, the task will become easy.

The philanthropic and capitalistic systems to advance industry in any country has not proved so useful as co-operation. Philanthropic passion subsides after a while, while a capitalist will work for his own interest. The most obvious characteristic of the capitalistic system is that the real power lies in the hands of the man who supplies capital. It is not the man who makes boots in the factory or who buys or uses the boots who decides what kind of boots are to be made but to the employer who puts his money in the business. Again it rests with him or his manager who represents him to settle the wages to be given to each worker, the price of the boot in the market or what quality of raw material to use. He may derive as much profit out of his business as he possibly can without any proportionate increase in the wages of the workers. This inequality of the rewards of capital and labour creates dissatisfaction among the employees which at times has assumed the form of serious strikes. The history of England affords striking illustrations of the labour unrest in the early period of the nineteenth century. That was the period of stress when food was dear and wages low. The owners of factories began to employ women and children who worked from 12 to 15 hours a day on reduced wages. The Factory Act was not being worked in the interest of the workers.

The gravity of situation created many social reformers in the country like Cobbett and Lord Shaftsbury. But the emancipation of the working classes from the tyrannies of the capitalists was destined to be made at the hands of Robert Owen rightly called the father of co-operation. Owen started life as a boy in a retail shop and finally became manager and proprietor of mills. Through personal knowledge by coming in touch with the working classes he treated them with sympathy and after great struggles succeeded in amending the law and regulations of the factories in their favour. This was not all. He introduced a different system which may be called a beginning at co-operation. According to him "competition, profit, private employer, the money wages of labour, etc., were the signs and causes of an evil system of production. It was a system under which there could be no real truth, honesty or virtue". The labour of a labourer however hard he toiled often went unrewarded. "He was born in misery, worked in misery and degradation and died just as he was born. Hard work, low wages, pauperism and distress are the consequences of working for others." The remedy was simple. Co-operation may be substituted for private employer. He obtained capital for the first societies he started by weekly deposits which were spent in buying common necessities for the members. The profits and the weekly subscriptions again were used to find work for some of its members. Finally with the accumulated profits land was acquired for residence or cultivation or building factories.

The ideal set by Robert Owen stimulated the 28 weavers of Rochdale in 1884 to form the now most famous Rochdale Equitable Pioneer Society. In the early days with a capital of £ 28 collected among themselves through subscriptions of two or three pence per week a small store was opened to supply domestic necessities for the members. By patient hard work following the co-operative principles the small capital of £ 28 has developed into a very big concern never imagined by the pioneers. The society has more than 14,000 members on its roll. Its sphere of activities now includes several boot-making bread-making and cloth-making factories. The annual sales are reported to exceed forty thousand pounds.

The example led many other countries in Europe to try the experiment. Germany was the first to assimilate its principles. Two of its greatest reformers, Raeffisen and Schultze, established credit societies in rural and urban areas respectively. The movement spread to Denmark and Ireland which are greatly benefited by it. India and Punjab did not remain unaffected. But in this subject I am only concerned so far as the movement touches industrial classes.

The most widely distributed industry of the Punjab is weaving which first attracted the attention of the Department. The weaver population of the Punjab at the last census was recorded

at 6 lakhs. The influx of mill-made goods cheapened the price of cloth considerably. The weavers are rapidly ousted from the town market and competition is following every new means of transport into the remoter villages. In order to hold his own the cottage worker must secure the advantage of (1) wholesale buying of raw material, (2) organisation, (3) improved methods of production. These are the objects of all kinds of industrial societies. There are about 150 societies of weavers in various districts of the Punjab, namely, Multan, Shahpur, Amritsar, Jullundur, Hoshiarpur, Lahore, Jhelum, Ludhiana, and Rawalpindi. Dyers, potters, shoemakers and tanners, carpenters and smiths are some of the other industrialists which are being drawn to the fold of co-operation. In these societies every member is required to subscribe shares by small instalments, the total value of which does not exceed Rs. 50 in case of weavers. Shares are returnable after 10 years. No dividend on shares is distributed for the first 10 years. In subsequent years a dividend of not more than 10 per cent. could be declared after carrying $\frac{1}{4}$ to reserve. Sometimes rebate or bonus is given to members on dealings with the society. The business of the society is concerned more with the supply of the raw material for the member's craft and with the sale of the finished goods, as far as possible, than with the lending of money in cash. This is the main distinction between an industrial and credit society. The capital of the society is composed of:—

- (a) Share capital.
- (b) Loans from the *Co-operative Industrial Bank, Amritsar*, or other Central Co-operative Banks in the various Districts.
- (c) Profits undistributed and reserve.
- (d) Local deposits from members and non-members.

The common rate of interest on borrowing ranges from 7 to 9 per cent. and on lending from 9 to $12\frac{1}{2}$ per cent. In each society a managing committee from the members themselves is set up. With the advice of the officers of the co-operative department it manages its own affairs, buys its raw material and distributes among the members, makes recoveries and arranges if possible to sell the finished goods.

These primary societies are financed by a Central Industrial Institution for the whole province, namely: *The Co-operative Industrial and Weavers Bank, Limited, Amritsar*, mostly in the form of raw material. On a working capital of about 3 lakhs it has made a reserve of about Rs. 30,000. The manager of this bank keeps himself in touch with big markets to supply raw material to the affiliated societies at the cheapest possible rates, eliminating the middleman's profits. The funds of the bank are derived through deposits from the public, Government, and other

co-operative banks' loans. It receives deposits at 6 and 7 per cent per annum. It would be a great help to the cause of industry if the wealthy and other people of the province invest their money in this bank.

The weaver societies produce khaddar, dassuti, lungies, turbans, dabba khes, bed durries, shirting cloth of all description produced on handlooms. The silk weavers make daryai, gulbedan, lachas and other fabrics of artistic value and utility. The prices are competitive.

The department is rendering help to the manufacturers by every possible means. Government and Railway Departments are approached to place the orders for their textile requirements to the co-operative societies through the Co-operative Industrial Bank, Amritsar. The officers of the Education Department would do well to see that small durries and dusters such as are required in the schools under them are purchased from the co-operative societies. The finished goods are exhibited on the occasion of horse and cattle fairs of the various districts.

Would that education officials and other departments as well as non-official bodies and individuals co-operate with the officials of the Co-operative Department in encouraging Indian indigenous industries and place these ancient callings on sound lines. The encouragement of cottage industries is not only an economic but also a social and moral problem of the greatest importance in this country.

CONSOLIDATION OF HOLDINGS.

BY KHAN BARKAT ALI KHAN.

In order to understand what is meant by consolidation of holdings I would divide the phrase into two parts holding and consolidation and define each part separately. Holding as defined in the Land Revenue Act, means a portion or share of an estate held by one landowner or jointly by more than one landowner. Consolidation when used in relation to holdings means concentration by transfer of scattered plots into one or as few compact blocks as possible. Consolidation of holdings therefore means concentration by transfer into one or as few compact blocks as possible of the scattered plots held by one landowner or more than one landowner jointly. To make myself more clear let me suppose for a moment that this hall represents the area of a village amounting to 500 acres and A who owns 50 acres of land holds a plot of 10 acres at the point where I am standing, another of 25 acres in the middle of the hall and the third measuring 15 acres in one of its corners. If by mutual

transfers with other landowners he arranges to have his 50 acres concentrated in one or two blocks we would say that A's holding has been consolidated.

Economists though differing on many land questions all are agreed that the social well-being of a country is fundamentally affected by the conditions upon which land is held. This is inevitable since of the three factors in the production of wealth—land, labour and capital—only the first is limited in amount. It admits of no increase by human efforts and yet human existence is an impossibility without it. The only thing left to human effort is to organise land in a way that would make it yield the highest possible return.

The survey made in 1920 in Jullundur District has disclosed that in eight villages 2,549 owners possess 12,800 acres divided into no less than 63,492 plots. The result of the survey shows that the average size of a holding in the district is 5 acres divided into 25 small plots scattered wide apart throughout the village area and that the average size of a plot does not exceed one-fourth of an acre. The neighbouring districts of Hoshiarpur and Gurdaspur things are no better.

It is generally recognised that in farming, size, shape and constitution of a farm are matters of much importance to success. In the Punjab the average holding is somewhere between 6 and 12 acres. The land being fertile and the zamindars industrious this holding is sufficient if right crops are grown, if there is sufficient labour and capital invested and certain other conditions are fulfilled. One of the conditions is that the holding should be concentrated so that the intelligence, time and energy of the cultivator should also be concentrated. But here custom orders otherwise. The custom recognized by the law of inheritance gives the male members of a deceased cultivator equal share in the property and right to partition at any time after succession. The strong tendency is that as soon as a brother begets a family he gets his share in the property separated and desires to have his accurate share in each class of land. Supposing that a man dies holding 9 acres of land divided into 3 plots of 3 acres and leaves three sons. It might be hoped that each son would take a solid plot of 3 acres settling with the others in money the balance arising from any difference in the quality of the different plots. This, however, seldom happens, but on the contrary each plot will be split up into 3 sub-plots of 1 acre each. Nor does the inconvenience end there, for the partition is effected in such a way as to secure an equal division of good and bad land in each plot and it often leads to a division in narrow long strips.

It is generally recognized that cultivation, manure, seed and climatic conditions are the four prominent features in crop production. From certain Government publications we find that

about one-half of the total cultivated area of the Punjab depends for its produce on rainfall. You may plough your land with the improved ploughs advocated by agricultural experts, you may enrich or dress the land with the best manure and you may sow the best seed available but if there is scarcity of rainfall the land will yield you nothing at all and all your investment of labour and capital will be wasted. Climatic conditions being beyond human power the question arises, what alternative can be suggested to secure certainty of crops. The answer in a word is "an irrigation well".

The most important and permanent improvement to the land cultivated to increase the produce is the construction of irrigation wells. By the help of irrigation wells cultivators are enabled to grow valuable crops and vegetables worth per acre ten times as much as anything that could be grown without their aid, or in the alternative to eke out the scanty rainfall and to grow considerable acres of the ordinary crops of cotton, chari, etc., to a state of excellence which would otherwise be impossible in most years.

A man who is protected by irrigation facilities against the worst disaster arising from failure of rain will work with greater energy which arises from confidence.

But fragmentation of land into an immense number of small pieces wide apart presents the greatest difficulty in sinking wells. As long as a holding is thus scattered the enterprise of sinking a well is not worth attempting. It would be nothing short of foolishness to sink a well in a plot, say, of $\frac{1}{2}$ acre because the increase in the yield in consequence of the conversion of such a small plot from dry into wet will not suffice even to cover interest on the capital invested. The neighbouring peasants would not let the owner of the well pass the water through their fields to his other plots and in case they happened to be friendly disposed and allow this a good deal of the supply of water would be wasted in the channel in running so far unutilized.

Difficulty in sinking wells is not the only disadvantage of fragmentation. They are too numerous to be stated but I would mention a few of them. Fragmentation renders supervision impossible or at any rate very expensive. It tends to litigation over boundary disputes. The cultivator has to exhaust all his own force and that of the bullocks in the cultivation of small parcels of land often distant from one another. A good deal of land occupied by myriads of boundaries and hedges remains uncultivated reducing the rental capacity of land. It increases the cost of enclosures. The application of the improved methods of agriculture becomes next to impossible. Fragmentation is, undoubtedly, an unmitigated evil which is handicapping agricultural industry and bars the way to progress.

From a study of the action taken in other countries it appears that in those countries remedy has been found in drastic measures in the form of law. In some countries a majority desirous of consolidation can by dint of legislation compel a minority to yield to it. But it is quite certain that a proposal embodying an element of compulsion here will be considered as an outrage to the people's sentiments and would meet with strong opposition. Compulsion is not palatable to the Punjabi.

It so happened that the three districts—Jullundur, Hoshiarpur, and Gurdaspur—where fragmentation has proceeded to a great extent are those in which co-operation has made most progress and in which the co-operation spirit has been best developed. Fortunately Mr. Calvert, our Registrar, realized that the remedy for the evils of fragmentation lay in "Co-operation." Early in 1921 he propounded a scheme for consolidation on co-operative lines and having discussed it in the various meetings of the co-operators prepared model bye-laws on a voluntary basis.

The scheme is that every application for membership whether he may be an owner or tenant, mortgagee or holding any interest in the land must agree to the desirability of consolidation and to the general idea of repartition of the village land and must promise to abide by a method of partition and actual repartition approved of by two-thirds of the members and to give up possession of his lands and to accept in exchange the lands allotted to him; and all disputes are referred to arbitration. Persons accepting these conditions can form a co-operative Consolidation of Holdings Society. Each member has to sign the register of members in the presence of two witnesses and an agreement setting forth the above conditions is also signed by him.

The general meeting discusses the mode of partition and decides on the main principles to be observed such as classification of land, retention of former possessions and division of trees, etc. In the case of any difference of opinion any resolution would only be binding if two-thirds of the members approve of it. If two-thirds of the members are not in favour of the resolution then it is necessary to devise an alternative method or the society dissolves. When a method of partition has been decided upon, the managing committee proceeds to draw up a scheme of repartition in accordance therewith. This scheme is placed before the general meeting and if two-thirds of the members accept it, it is binding on all, if otherwise it is discarded. In case the scheme is approved in the manner prescribed the members are bound to give up and accept possession in accordance with it. An aggrieved member can refer the point in dispute to arbitration.

The power of compulsion by two-thirds majority has so far never been used, because if a revolution of this nature is to be carried through on permanent basis, all concerned must be

satisfied and none left discontented. In all the societies so far organized the mode of partition approved unanimously has been acted upon and no repartition has been confirmed until accepted by all concerned.

The propaganda work is entrusted to the credit staff. When the local credit Inspector or Sub-Inspector visits a village to inspect or audit the credit society working there he explains to the members of the institution the evils of fragmentation and the advantages of consolidation and impresses on them the necessity of removing the evil by organizing a co-operative consolidation of holdings society for the purpose. Where the inspector finds the people inclined to have their holdings consolidated he communicates with the local consolidation inspector. The consolidation inspector then deputs one of his sub-inspectors to visit the village.

The consolidation sub-inspector proceeds to the village and collecting the people explains to them the evil effects of fragmentation and the benefits of consolidation. If people agree to the desirability of consolidating their holdings and offer for the purpose the whole or a part of the village area he proceeds with the organization of the Co-operative Consolidation of Holding Society. A committee is selected from among the members interested and a mode of partition worked out by the committee. Each member is then requested to sign the members' register and the agreement prescribed and model bye-laws are adopted.

The consolidation sub-inspector then proceeds to collect from the revenue records necessary material to start repartition. He prepares from the last Jamabandi a list showing the survey no. with area and classification of the fields held by each of the members. After this has been done he looks into the mutation register to find out which of the mutations sanctioned after the preparation of the last Jamabandi are to be incorporated. Each survey no. is then classified as 1st class, 2nd class and so on in the general meeting after consulting the members concerned. The material thus collected enables the sub-inspector and the committee to work out how much of each class of land each member or group of members is entitled to have in the repartition. At this stage the sub-inspector traces out a new field map. The committee and the sub-inspector then are confronted with the most difficult task of reallocation.

The field map is then placed before the members and each member or group of members is asked to select for himself a tract with due regard to the model partition classification and amount of area to be allotted.

The repartition papers are then laid before the general meeting for approval. As soon as repartition is approved the pencil marks in the field map are inked and field book prepared.

The blocks allotted to each member are then demarcated to him on the spot and mutation entered. If the possessions are changed and all concerned accept the repartition, the mutation is sanctioned by the Revenue Officer and application for registration sent up to the Registrar.

With a view to minimise the danger of dishonesty on the part of the sub-inspectors, no mutation is laid before a revenue officer until each member or group of members is supplied by the sub-inspector with a parcha showing the survey nos. with area, class and land revenue offered for consolidation and the survey nos. with identical particulars of the land allotted to him in repartition. The sub-inspector is required to give in the parcha a trace of the blocks with dimensions and boundaries of the blocks allotted. In token of his having given the parcha, the sub-inspector is required to take signatures or thumb impressions of the members in the Proceedings Book as receipts for the parcha. The inspectors have been held responsible to see that the parchas are given in all cases.

The consolidation staff, all paid by Government, consists of 7 Inspectors and 70 Sub-Inspectors, all drawn from Revenue subordinates of the districts concerned.

On 31st July 1926, when the banking year closed, we had 255 registered co-operative consolidation of holdings societies spreading over 12 districts. In these societies 12,649 members who formerly held 60,015 acres of land in 58,710 blocks have now, as a result of repartition, the same area in 16,458 blocks and the average size of a block has increased from .7 to 3.6. It is very interesting to observe that the repartition of 21,000 acres in the single year of 1925-26 led to the breaking of 1,300 acres of new land and the extension of irrigation to 1,600 acres. Improvement of agriculture is general in villages where holdings have been consolidated. Improved implements are used and seeds recommended by the Agricultural Department are sown. New wells are sunk and old ones falling out of use are repaired. New roads giving access to each block have in several cases been made. In some cases enclosures or thorn hedges or mud walls round blocks have been made.

Causes of quarrels and litigation are reduced. Civil suits and revenue proceedings for partition naturally lapse when the boundary rights to which they refer are swept away by the repartition. Rental capacity of the areas consolidated has enhanced partly by the removal of the myriads of the boundaries and partly to the fact that the supervision expenses have been reduced to a minimum. In most cases the strips of land which, being too narrow to be ploughed, were neglected, have been brought under cultivation. The increase in the rent has made the members more contented.

In several cases consolidation has tempted the zamindars to resort to intensive cultivation which is more paying than the extensive.

This form of co-operation is admittedly very useful and at the same time very difficult. Difficulties experienced in successfully organizing a society of the kind are many, but I would like to state here a few of them. Each man fancies that his ancestral plots are the best ones and he therefore dislikes the idea of exchange. One of the chief objects aimed at by the consolidation is to afford facilities in sinking irrigation wells. Before a well is constructed and irrigation commenced the land may be designated as Mera Retar Niyan, etc., but as soon as it is commanded by the well all these three classes emerge into one Chahi. It should therefore be explained to the Zamindars that they should start the consolidation with the belief that sooner or later the lands are to be converted into Chahi.

Old men hate to be disturbed. Where mortgagees object to consolidation they should be threatened with the redemption of mortgages.

The occupancy tenants hesitate to join a consolidation society fearing that their reversionary rights will be lost in consequence of the exchanges as a result of consolidation.

Minors and absentees prove a source of trouble. Their next friends and co-sharers should be held responsible for the exchange effected.

The village Patwari is inclined to oppose consolidation. He sees his income from litigation threatened with reduction. Government has ruled that a Patwari assisting in Consolidation may be rewarded to the amount of Rs. 50.

CREDIT.

BY CH. IZZAT ALI.

Credit comes from a word which means something believed and may be defined as the belief in the future repayment of the money lent out. The basic principle is the confidence in the mind of the lender that the money or its equivalent will be repaid to him at the proper time; but there may be cases in which such confidence or belief may not exist and there may be only expectation or hope that the borrower will repay the money. Such a transaction may properly be called speculation; the difference being that in the former case the lender is confident that the debt will be repaid to him at the time of maturity and in the latter the transaction is based on a mere hope. Since if the lender is acting on the basis of expectation only and does not adopt the precautions and the safeguards necessary for the

sure repayment of his loan it is possible that some of his loans may not be returned to him and he may have to incur losses which have to be recouped from other loans. He has to include the cost of his personal inconvenience and other charges in the rate of interest, as in some cases he has to resort to the courts of law for the recovery of his debts. Thus it is clear that in such cases the rates of interest are generally high and the speculator gains over a series of transactions even if he has to undergo losses in a few. Thus the rate of interest acts as a rough guide to distinguish a transaction based on speculation from the one on credit and it may be remembered that speculation is not only harmful for the borrower but also for the lender.

Credit is generally classed under three heads :—

1. Real Credit.
2. Chattel Credit.
3. Personal Credit.

Classification is made according to the form of security offered and accepted in a particular loan. In the first case, that is real credit, land or any other immovable property stands as security and is ordinarily used for long term loans repayable in ten, fifteen or more years. The second form of credit is based on the security of movables such as ornaments, furniture and so on. In the form of personal credit the character, property and industry of the borrower and his sureties are taken into consideration.

In order to be able to make sure that the loan will be properly repaid at the time of maturity the lender has to observe certain precautions before making an advance; otherwise the loan will not be safe in the hands of the borrower and probably its repayment will not be so easy. He has to be certain whether the borrower will be *willing* to repay, secondly whether he will be *able* to repay, and thirdly whether the *willingness and ability* of the borrower will exist at the time when the loan falls due for repayment. He should be certain of these three points before advancing a loan and the neglect of even one of them will endanger a loan. The above-mentioned qualities of willingness and ability must go together and one without the other will not help the lender in attaining his object. It is obvious that the willingness to repay without the ability to do it is no good to the lender; and similarly the ability to repay without any intention of doing so it will be the cause of trouble and also it is of little use to the lender if the borrower is both willing and able to repay at the time of taking the loan or a little afterwards if later on the ability or the willingness disappears.

In order to test the willingness for repayment of the borrower lender should have an intimate knowledge of the borrower's

character and the ability to repay depends upon his habit of industry and the property he possesses. It is rather difficult for the lender to judge that the willingness and the ability of repayment will be present in the borrower at the time when the loan falls due for the repayment, but by advancing loans for strictly productive purposes and making them repayable at a time when the borrower will have income from the application of the money the lender strengthens the borrower's ability to repay; so the loan must be made for the productive purposes in order that the borrower after repaying principal and interest should have a margin of profit for himself. The position of an agriculturist borrower differs from that of a trader in that the latter borrows on the security of the goods which he has ordered and the bank which pays for him to the manufacturer keeps the goods in its possession till the payment is made, but in the case of the farmer a loan for productive purposes may ultimately be affected by cattle plague, or a calamity may materially change the financial position of the agricultural borrower and instead of a profit and a return for his labour he may be left even without the capital which he so carefully sank in the land. Thus it is clear that the lender should be careful and cautious in advancing loans to farmers; and in order to safeguard the interest of the lender it becomes necessary to take some extra precaution in such cases, that is, he should always insist upon good security so that in case of the borrower's failure to repay the lender may have something to fall back upon. The different forms of securities have already been dealt with under different forms of credit and I feel no necessity of repetition.

In a co-operative credit society at the time of fixing each member's maximum borrowing limit the same principles are observed. But it is sometimes argued that such and such a member holds large landed property, owns wells and a number of cattle therefore his Credit Limit may be fixed at any high figure. The most important point which is often overlooked by the simple village folk is the borrower's intention of payment, of which they have to be reminded over and over again. In actual practice it is found that such big men sometimes turn out to be the serious defaulters against whom the members appear to be reluctant to take any action. Similarly the honest and hardworking labourers and Kamins of the village are sometimes not admitted in the society on the ground that they do not hold any landed property; but through the persistent teaching of the co-operative staff the prejudice is disappearing and the poor men now freely join our societies. Separate societies for the people of low castes have also been organised where there is sense of responsibility and intelligent workers are available to form a managing committee.

Credit plays an important part in all industrial transactions most especially in agriculture which is the greatest and most important of all industries; therefore it is necessary to understand

its nature, its proper use and the dangers and consequences of its abuse. Sir F.A. Nicholson in his famous report says, "Credit is a weapon that may destroy the unskilful wielder; it is helpful or destructive according as it is used or abused." The abuse of credit is manifest in many cases where the creditor has to seek the assistance of the courts of law to recover his debt and the borrower instead of making an improvement in his material and moral position has effected deterioration in both the directions. The necessity for credit in agriculture has been recognised everywhere and the experience of agricultural conditions all over the world shows that borrowing is an essential of agriculture. The farmers of the countries which are advanced in modern methods of agriculture generally require loans for intensive farming for which their own capital is most often insufficient and in countries where agriculture has not been developed on modern lines, the agriculturists cannot escape the necessity of borrowing. Agriculture depends upon the vicissitudes of nature more than any other industry. After a farmer has spent a lot of his capital and labour in the land he cannot be certain in all cases that he will get sufficient return for the services of capital and labour and have a margin of profit for himself. He is harassed by seasonal disasters which cannot be averted by his intelligence, skill and foresight. Sometimes excessive rain and flood sweep away his cattle, crops and cottage, everything of which he has to replace by means of the further investment of capital; for which he has to go to the door of a money-lender. At other times drought may be the cause of the destruction of his crops. Hail-storm, cattle disease and insect pests may ruin the fruits of his skilful labours and destroy his capital from which he cannot possibly expect any return. In the above-mentioned cases the farmer has to borrow necessarily to replace his cattle, to build a house for himself and his family and a shed to protect his cattle from the extremes of hot and cold seasons. He may also require a loan for the payment of land revenue, seed and grain till the next crop ripens. His habits of thrift and prudence may help him to overcome the misfortune to a certain extent but cannot altogether abolish the necessity of borrowing. But it is found that zamindars do not always borrow for these objects only. Credit is made too easy for them, consequently the tendency to borrow for unproductive and unnecessary purposes is great.

The most injurious effect of easy and facile credit as compared with the benefits of guided guarded and controlled credit are many and have been the cause of ruin of so many Punjab peasants. There are few persons who will not borrow if the borrowing is made too easy.

My experience of the working of the co-operative credit societies of the clerical staff of offices shows that some of the clerks remain under heavy debt to shop-keepers who have made shop credit too easy for them. Last summer when the Muslim

Co-operative Credit Society of Simla was in the process of formation a friend of mine was very pessimistic about the success of the society and told me that the members would prefer shop credit and would not like to borrow from the society under the present bye-laws which imposed so many restrictions upon borrowing, but thanks to the efforts of its able and popular president and the committee the society has made rapid progress and in a few months' time the membership doubled and the society has been able to attract a large amount of capital.

Easy credit encourages extravagance and discourages thrift and economy. Loans for unproductive purposes such as ceremonial expenses and litigation are the results of easy and unthoughtful lending on the part of the creditor and produce grave consequences for the borrower. Heavy burden of debt descended from father to son and lower down to generations are the curse of such borrowing. There may be few people who save money for such unproductive expenditure but there are many who borrow for such extravagance. Another great defect of facile credit is that it destroys the borrower's character without making him realise when and how to repay the loan. My opinion is that the peasants of India have contracted the serious habit of default through centuries of dealings with the money-lender who was contented to receive payment of interest only and never pressed for the recovery of principal as long as he knew that his client had the ability to repay. In a new society the members revolt at the idea of making six monthly repayments and feel it a great hardship as compared with the Sahukar's system of recovering his dues. The societies cannot be expected to eradicate this habit of long standing in a few years' time but the hopeful results are manifest in many of the societies of over ten years' standing. A quarter of century's working of the co-operative credit societies in the Punjab will produce marvellous results in this respect.

Easy credit is also a cause of high interest. When a lender is confident that the loan with interest will be repaid out of the expenditure of the loan he can afford to charge low interest and when he is not certain he always charges high rates in order to protect himself against possible losses; however, he makes profit over a series of transactions. High interest slackens the borrower's efforts in respect of good cultivation because he knows that the fruits of his labour will go to benefit the money-lender. It has been found from experience that the highly indebted persons, who do not know how to repay their debts do not take much interest in cultivation. The sources from which the agriculturists borrow are generally one or other of the following :—

1. Money-lenders.
2. Government.
3. Land Banks.
4. Co-operative Societies.

It will be of interest to compare these systems of credit briefly and to see which of them is useful for the small illiterate agriculturists. It is the experience of almost every country that the moneylenders have been the cause of much indebtedness and poverty by granting credit too easily; by charging heavy rates of interest and by their failure to insist upon punctual repayments. Some evil effects of private money-lending will be clear from an extract from Sir F. A. Nicholson's report which reads as follows:—

“The borrower finds ‘safety’ only when the lender has no interest in his entanglement. The history of private money-lending throughout Europe declares that such entanglements whether intentional or otherwise, is general, and it is absolutely certain that myriads of cases such entanglement is deliberately promoted for the purposes of private greed, whether such greed be for money, or land or for power. Such is equally the lessons of Indian money-lending. Apart however from deliberate entanglement or fraud it is certain that the embarrassment of the borrower is habitual when the lender is an individual; the rates of interest are so high; the terms of repayments so unsuitable that the borrower who enters the net of money-lenders seldom extricates himself save at serious loss.” Although the report was written a little more than a quarter of century ago, the conditions of private money-lending have undergone little or no change.

In some countries Government advances loans to agriculturists directly such as the Takavi system in India. It is a rigid system of credit and does not suit the agricultural conditions. The money is advanced for productive purposes only through the Revenue Officers who are not in a position to know whether the applicant for a loan is really in need of it or not. The instalments for repayment are fixed at the time of making the loan and are strictly adhered to. It is possible that a zamindar who has borrowed the money from Government for the purpose of bullocks may have to repay it by the mortgage or sale of his land in bad seasons. Moreover it is very difficult for the revenue staff to ascertain whether the money has been applied to the purpose for which it was borrowed. It is practically impossible for any Government however prosperous it may be, to finance the agricultural requirements of any country and manage economically the enormous credit business.

Land Banks have also been tried in some countries but experience has shown that they have serious defects and are not suitable for the small agriculturists. Loans are given on the security of the land only and most of the drawbacks which are found in

the Takavi system such as those relating to the enquiry as to the need of the borrower and supervision as to the expenditure of the loan are also present in the land bank. In Egypt and some other countries the evil effect of these banks have been recognised and co-operative credit societies are now favoured.

A co-operative credit society of agriculturists is registered on the unlimited liability of the members who are individually and collectively responsible for the debts of the society ; therefore the area of operation is generally limited to a village so that mutual knowledge and mutual control can be easily exercised. The members only are the borrowers and the masters of the society so that the interests of the borrowers and lenders are harmonised. Before admission to a society every person is to be duly elected by the managing committee and confirmed in the next general meeting so that any undesirable person may not get in and cause harm to the society. A committee of management is elected every year from amongst the members to carry on the business of the society under certain powers sanctioned by the general body of the members. Loans are advanced for productive, and necessary purposes only after making thorough enquiry as to the need of the borrower. They should not exceed the maximum borrowing power of each member fixed and revised by general meetings from year to year on the basis of the member's ability and willingness to repay. The committee keeps a careful watch to see whether the loan is faithfully applied to the object for which it was sanctioned and if misapplied the loan is recalled. In small villages where the activities of such societies are limited to one village only and in the large villages and towns where the working area does not exceed the limit of a street or a mahalla it is not at all difficult for the committee and the members to exercise such a control. Besides this, two sureties are taken with each loan so that they may also watch and impress the borrower for repayment. Easy and suitable instalments are fixed and extension granted if the borrower is in distress on account of bad harvest or other reasons; however, punctuality is strictly observed in all other cases. The rate of interest is sufficiently low, about half as much as charged by the money-lenders, and the owned capital is steadily built up to lower the rate of interest when conditions allow. Thus it is clear that only this system of credit is useful for agriculturists which, besides being cheap, is carefully organised and controlled and teaches the borrower the lessons of thrift, mutual help and self-help.

SUMMARY OF A PAPER ON CO-OPERATION IN SCHOOLS.

BY L. RAM LAL KANWAR,

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The two kinds of co-operative societies found in schools are Thrift Societies and Supply Societies. Such societies are very common in the Punjab, but the difficulties which hinder their working are (1) lack of confidence in the success of the societies among teachers who tend to think that no kind of combination will succeed; (2) unwillingness to take any risks; (3) the unfortunate over-zealous attitude of many enthusiasts who addressed the pupils and teachers and gave the impression that Government wanted to "crush the bania" or to compete with local banks; (4) members of thrift societies sometimes expect too much, and think they should receive more interest than they do receive; (5) bad book-keeping; (6) inefficient checking of accounts which in some cases leads to fraud or misuse of funds.

Wrong ideas should be removed and the principles of co-operation taught in all schools. For success, perseverance and good business methods are essential.

"SUPPLY AND SALE."

BY CH. NAWAB ALI, B.Sc.,

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SUPPLY.

"The poor man is a loser when he buys and a loser when he sells." This is a quotation from a recent booklet by Mr. Strickland. That the poor man loses in purchases of his necessities and in sale of his productions and the rich man gains in both these transactions is not simply due to their poverty or richness, but is based on the business principle that big customers and sellers are welcomed everywhere. Always the best terms are offered to them and the sales and purchases of a poor man are insignificant for obtaining for him fair quotations. The rich man being able to buy and sell in large quantities and at good markets, in touch with the prevailing rates and free to transfer his purchases, and postpone his sales, is in a position to influence the seller, the broker and the market, while a poor peasant or a humble craftsman, ignorant and far off from markets, and dealing with a local retailer, must accept what is presented to him, until he organises himself with his other fellow workers and influences the terms of sale and purchase. His organisation for credit has given him the command of capital, whereas in his

unorganised state he had to take on credit any seed, cattle, or food grain (of worthless quality). His organisation for supply of his necessities and sale of his produce can obtain for him the position enjoyed by the big purchasers and big sellers. Such associations for joint purchase are called co-operative supply societies or stores and those for joint sale are called sale societies or shops.

It is generally supposed by ignorant as well as educated people that co-operative societies, for credit, sale and other purposes are beneficent institutions for the poor and needy. This is an altogether wrong conception. They are self-help and mutual help associations and the benefits accrued therefrom of reasonable credit in a credit society, of genuine and good articles at lower prices in supply societies, and, of fair treatment and better prices in sale societies are due to the joint responsibility of the members and to working on sound business principles.

The idea of co-operative supply on modern lines was first conceived by 28 flannel weavers of Rochdale near Manchester in the year 1843, when one evening, they met together to devise some remedy for their desolation and misery, aggravated by industrial revolution, and planted the fruitful germ of distributing co-operative societies. "Many persons" they observed "grow rich by selling to us, what we need retail. Clearly, therefore, something sticks to their fingers, something is withheld in their interest, so that they are enriched at our expenses. Why should not we become rich by banding together to buy wholesale the goods they sell us?" This conception of the Rochdale pioneers was the real foundation stone of the store movement which was worked so well in many countries and this strongly contrasts with the institutions of the kind organised prior to it.

The stores make joint purchases of good articles, sell them to both members and non-members in cash at current market rates and allow the rebate according to the amount of each member's purchases. The rebate allowed to non-members is less by $\frac{1}{2}$ than the rate allowed to members and is credited to them to form shares in the society. The practice of cash sale at market prices has led (by the accumulation of capital) to many educational and social developments. The supply of good articles, the use of full weights and measures, and the democratic right of voting in the conduct of their affairs have led to the gigantic success of the Rochdale pioneers' stores, which only began with a capital of £ 28 and with a membership of 28 in 1844. In 1891 the membership of the stores rose to £11,647, with a working capital of £370,792 a turn-over of £296,025 and a profit of £52,198. Stores of the Rochdale type have become so successful that in the year 1920 in England only there were about 1,379 such stores, with a membership of more

than $4\frac{1}{2}$ millions carrying on an annual trade worth more than £254,000,000. England leads the other European countries in the distributive movement because most of its stores have followed the traditions and practices of Rochdale.

Another type of stores sells on credit and has achieved comparatively little success in any country. In some European countries, there is a type of supply society which instead of supplying to its members their necessities, arranges to get articles at concession rates from other shopkeepers and receives a commission, which goes to make capital of the society for running supply work itself. This is not the best form of co-operation and the success attained is meagre.

Assuming loyalty and efficiency of the management, the economies of Rochdale type stores are manifold; purchases in bulk from the original producer, no advertisement costs, assured supplies of goods, and cash sales go a great way in increasing the savings of members and in influencing the production of genuine articles, whereas it is generally observed that in the ordinary way, in their transmission from one middleman to another, commodities are adulterated, giving a bad name to the producer and causing disadvantage to the consumer. The Rochdale type of stores has succeeded wherein its principles have been closely adhered to. Cash sales ensure a rapid and big turn-over, no losses by bad debts and litigation, and simpler accounts as compared with the vicious system of sale on credit.

Another question of vital importance is sale from cash and at current rates. The chief cause of the failure of other types of supply societies is due to the attempt to sell at cost price. This system invites competition with the retail dealers, creates no reserve to meet accidental losses and ultimately smashes the store. Such stores having no provision for profits are not in a position to make any educational or social developments. In India too, the practice of selling at cost price has been one of the main factors of the meagre success of the co-operative supply.

Sales at market prices invite no competition with the local retail dealers, create a reserve to meet sudden losses and accumulate capital which helps in developing the social and educational activities of the members. Moreover such sales lead to economy among members which is materialised at the end of each year in the form of a rebate. This too leads to elevation of the character and status of the members.

The question of sale to non-members has led to many discussions from the co-operative point of view. Its extension to non-members is one of the fundamental principles of the Rochdale type of stores. Allowing $\frac{1}{2}$ the rebate given to members and crediting this to their share money solves a legal objection and

leads to the increase of the share-capital and reserve of the store. Mr. Strickland in his book "An Introduction to Co-operation in India" suggests that Indian stores should sell to non-members like the British supply institutions. The unfailing loyalty of the members should also go hand in hand with the above-mentioned principles underlying the working of these stores.

Supply work in the Punjab was begun in the year 1917-1918, at a time when citizens and villagers felt acutely the pinch of high prices and of exorbitant profiteering by middlemen. To begin with, in rural areas the work of supply was taken up by the ordinary credit societies, federated in the following years into supply unions for securing the advantages of the bigger purchases. The byelaws of a credit society allow "Supply" transactions, and the dearth of capable committee members did not allow of registration of separate supply societies in villages already having credit societies. It was only in urban areas, and in villages where there existed no separate credit society, that the start of separate supply societies was made. In the beginning work was begun on the indent system; credit societies collected indents from their members for supply unions which effected purchases and distributed to the societies for distribution among their members. In spite of the initial difficulties and the competition of the local dealers, in the first few years, particularly in consequence of the pinch of high prices, these societies worked fairly well, so that in the year 1917-1918, 28,389 maunds of salt, 900 tins of kerosene oil, (13,000 gallons), cloth worth Rs. 10,000 and 6,000 maunds of seed were supplied to the members, mainly through credit societies and in a few cases through separate supply societies, which numbered only 8 at that time. The commodities were sold at cost price and the estimated savings to members in the form of reduced prices amounted to about Rs. 71,000. The total supplies in the year 1918-1919 amounted to goods worth Rs. 6 lakhs, 3½ lakhs by credit societies and 2½ through supply societies, which had by this time risen to 102 (74 supply unions and 28 supply societies). The year 1919-1920 was also one of fair progress. The total number of supply unions rose to 117 with 1,601 societies as members, the number of urban supply societies reached 118, the total transactions done through supply societies and credit societies amounted to Rs. 13 lakhs, chiefly in iron, salt and cloth. An Information Bureau at Amritsar was started in the same year to facilitate this branch of work. Among the urban supply societies, the Khalsa College society topped the list in turn-over, which amounted to Rs. 50,663 in the year, saving Rs. 16,000 to its members. The year 1921-1922 marks the decline of the supply societies, due to the disloyalty of members and their unbusinesslike habit of demanding goods on credit, difficulties in railway booking, the unsympathetic attitude of the railway subordinate staff, the appreciable fall in prices and excessive reliance of the members on our staff. Transactions fell from 13 lakhs to 6 lakhs. The year 1922-1923 also showed a

decline in view of the causes mentioned. The Information Bureau was closed and the special supply staff were withdrawn. The turn-over showed a decline of Rs. 18 lakhs as compared with the last year. 1923-24 showed the disease still worse, the curse of easy credit, the tendency of people towards shop credit, their indifference towards the purity and quality of the commodities, the want of business instinct, and public spirit and loyalty combined with the inefficiency and dishonesty of the managers, heavy losses in the value of stock due to the general fall in prices, incapacity to work upon the indent system and lack of sufficient knowledge and experience to run a society on the store system were further causes which contributed to the failure of the movement in this branch. By the end of the year 1924-1925, the number of supply societies was reduced to 33 with a turn-over of Rs. 3,40,000, this work being done by a few live societies such as the criminal tribes settlement at Mughalpura, the Khewra Mines and the Khalsa College.

The working of the year 1925-1926 shows the survival of only 5 active supply unions while 7 criminal tribes settlement societies in villages of Montgomery and Multan Districts controlled by the Criminal Tribes Department with a share capital of Rs. 6,000 had a turn-over of Rs. 88,500 in the year, earning a profit of Rs. 8,500 for their members. The sales are made at market prices and the staff is well paid. True weights and measures are used. The urban supply societies are now 26. The Khalsa College and the Reformatory School at Amritsar with 4 Normal School societies elsewhere sold goods worth Rs. 66,500, the Mughalpura criminal tribes settlement sold Rs. 40,000 and the Khewra Miners stores Rs. 32,000. All are under paternal management. The working of the criminal tribes settlement societies and others which are active shows that reconstruction upon the ruins of former failures and experiences is not impossible, and the results achieved show that under efficient and honest management rural supply can confer great benefits on the members.

The initial impulse to supply societies in schools was given in 1916 by Mr. H.G. Wyatt, I.E.S., Inspector of Schools, at the instance of Mr. Strickland in the Rawalpindi Division. The Khalsa College supply society was registered in Amritsar in January 1917, and in the year 1918-19 the number of schools and college supply societies rose to 75 with a turn-over of Rs. 25,000. The majority of these school societies (since their members are minors) remain unregistered, but those societies in colleges and normal schools, which supply for registration, are registered. In the year 1921-22, the number fell to 62, and the turn-over exceeded in value Rs. 42,600, and the estimated net savings were about Rs. 25,000. In the year 1922-23 the total number was 82 (5 registered and 77 unregistered); total sales amounted to Rs. 34,000. In 1923-24 there were 64 societies but details for this year have not been recorded.

The number of unregistered school supply societies is now 96, of which 59 are reported to be doing useful work. There are four registered normal school societies. The Khalsa College supply society is also working well. For its efficient and good management Kamalia High School Supply society deserves special mention with a membership of 523 and turn-over of above Rs. 4,000 a year. It deals with books, stationery, boots and other necessities and is truly co-operative. Much of the success of these societies depends upon the interest and keenness shown in their working by the heads of the institutions.

The object of the supply societies in schools and colleges, is to teach the boys the principles and practice of co-operation and to buy books, stationery and other necessities for boys of the secondary department who become members, boys of the primary department and the employees and masters of the school. Membership is open to boys of the secondary department and school employees by payment of a share of Rs. 2, payable on admission or in monthly instalments of As. 8. The management is in the hands of a committee consisting of at least 5 persons, including the headmaster of the school who acts as ex-officio president and can veto the proceedings. The remaining 4 should be from the students of the secondary department. The secretary and the salesman may not be members of the committee; they are elected every 3 months; for their good work they may be allowed honoraria with the previous sanction of the Circle Registrar. No dividends are allowed on shares. One-fourth of the net profits must be carried to the reserve fund; out of the remaining profits, contributions with the sanction of the Divisional Inspector of schools may be made to the games fund or some other object of common utility.

The survival and success of some supply societies speaks of a hopeful future for the movement, provided the members assimilate the essential basic principles stated above. The Triplicane store at Madras with a humble beginning, humbler than even the Toad Lane store of the Rochdale pioneers, has shown to India, what good and sound business means. It began its work in 1904, with share capital Rs. 70, total capital Rs. 310 and a membership of 14. It has now 4,200 members and share capital of Rs. 60,000, reserve fund Rs. 62,000; Common good fund Rs. 27,000. The excellent working of this society and of the criminal tribes settlement societies in the Punjab have a lesson to teach that supply can prosper if worked on sound principles and with honesty of purpose. The success so far achieved by school supply societies is insignificant, and the future totally rests with the keenness and the enthusiasm of the Headmasters and other teachers. It is more important than mere book knowledge in History and Geography and teachers who do not pay attention to this important work will not only be doing a disservice to the boys but to the whole province, for boys are the future generation and

upon their intelligence and practical commonsense depends the future of the country.

SALE.

As already stated, the peasant has to deal with the retail dealer for purchase of his necessities and for the sale of his products. In both cases the retail dealer represents the lowest rung of a series of middlemen, each of whom in his turn, besides profiteering, continues to spoil the quality of commodities and produce by adulteration till they reach the final consumer in an altogether changed form. In this the producer gets a bad name for no fault of his own, while the consumer pays for adulterated articles that not only do him no good but may do him harm. Though the producer has every right to deal direct with the consumer and to eliminate as many unnecessary middlemen as possible, yet nobody will grudge the middleman a fair and decent return for his services. His malpractices, such as his unauthorized charges, cheating in weighing and adulteration, have stirred producers to replace unnecessary middlemen and do away with as many of them as possible by organising themselves into supply and sale institutions. If both these forms of organisations develop, they will be removing unnecessary middlemen from both sides and this will bring the producer and the consumer material advantages and will help in preservation of the quality of commodities.

As the sale of finished goods by craftsmen will be dealt with separately by the Industrial Inspector, it seems appropriate that I should restrict my description to the marketing of agricultural produce.

A few remarks about the fundamentals of marketing will not be out of place. Firstly, marketing must be recognised as a part of the productive process, which consists of two divisions, manufacturing or crop raising on the one hand and marketing on the other. The marketing part of production is as important as the manufacturing or crop raising part. A comparison of the farm or factory prices with final retail prices, the difference representing the cost of marketing, will amply demonstrate this.

The problem of the best methods of marketing agricultural produce is receiving deep consideration in most countries of the world. In America, the Federal Government employs experts to study methods of marketing the different farm products, and the office of marketing in the Department of Agriculture receives substantial grants for this purpose. In Minnesota, U. S. A., 1/3rd of the grain marketed is handled co-operatively and it is estimated that about Rs. 30 lakhs per annum is saved in this way to the farmers of the State. In the year 1922, the

turn-over of the agricultural sale societies of the United States of America was over 300 crores of dollars (300,00,00,000 Dollars equivalent to Rs. 9,00,00,00,000).

In Germany before the start of granary societies, the condition of the cultivator as regards the marketing of agriculture produce was deplorable. The granary societies with substantial help from the Government have done much useful work and have proved a great blessing inasmuch as these institutions have broken the monopoly of the grain dealers, have obliged them to pay a fair price for farmers' grain and have eliminated unnecessary middlemen. These institutions have enabled the cultivator to sell his produce direct to mills and breweries, have made him sure of his markets and able to sell at any time of the year, arranged for him a supply of good seed and thoroughly sound manure and have thus relieved him from serfdom to the grain dealers.

A beginning has been made in 1919-1920 in the Punjab for marketing agricultural produce, and the experiment was started in the Lyallpur District, where the *arhatis* of the grain markets had spread in the colony a pernicious system of credit and combined it with that of marketing. In fact in the canal colonies the origin of rural indebtedness is traceable to the grain market *arhati*, who throughout the year without any security advances loans to cultivators on the condition of selling their produce through him in the market. For others he arranges through the village petty money-lenders and grain dealers to whom he advances loans at a low rate and who in turn issue loans to the cultivators at high rates of interest; he thus controls the sale of the agricultural produce of the cultivator to whom he behaves as he wills, and who must sell to him all his surplus produce, and pay the *arhati* other arbitrary charges in addition to interest. Thus the cultivator has no freedom of action and is not in a position to get a full price or a fair advantage from the produce that he has produced so laboriously. The earnings of the village grain dealer and the *arhati* (apart from interest charges) are enormous, and at a minimum may be estimated at no less than Rs. 28 lakhs annually for the one district of Lyallpur and many crores for the whole of the Punjab.

The starting of co-operative commission shops was made in the year 1920, and 3 societies with 210 members, and share capital Rs. 39,700 were founded; their present number stands at 14, including the Okara sale society. Eight of these are on the Lower Chenab canal and the others at Abohar, Gujranwala, Jagraon, Sillanwali, Sonapat and Okara. In the year 1925-26, they sold produce worth Rs. 40½ lakhs, of which 21 lakhs were sold by shops in the districts of Lyallpur and Sheikhupura, and 4 lakhs by other shops. The sales of the Okara society amounted to Rs. 15½ lakhs. Several are quite new and have not had time to effect much. Five more shops are under formation. The benefits

derived by members are very considerable. In addition to the difference in the rate of commission, there is fair weighing and measurement, prompt payment and education in marketing. Although these shops had a humble beginning, yet in spite of continuous opposition by *arhatis* (who are always ready to organise boycotts against them) and the village grain-dealers, and despite the carelessness and disloyalty of some of their own members and influential Zamindars (working as agents of *arhatis*) they have every year shown progress. The number of members at the start was 210, with a share capital of Rs. 40,000. The present number of members is 2,255, including 510 societies, with a share capital of Rs. 1,93,502 and sales worth about Rs. 40 lakhs. For the co-operative year ending July 1924 the savings of those who marketed their produce through co-operative commission shops are estimated at Rs. 37,000 while the total savings of such persons from the year 1920 to 1924 are about Rs. 1,16,000. The savings for the years 1925 and 1926, in view of the increase in volume of work, should roughly be double this sum. These savings consist of (1) profits which otherwise go to the village grain dealer, (2) the difference between the rate of commission charged by ordinary shops in the grain market and that charged by co-operative commission shops, (3) considerable sums representing the losses by false weighing, cheating and arbitrary charges. The above-mentioned savings are in addition to the dividends distributed annually to the members.

In the long run the shops aim at bringing the producer into as close a touch with the consumer as possible and thus by removing unnecessary middlemen seek to lower the cost of marketing and secure the difference for the cultivators. They also help in breaking the pernicious system of credit in vogue (combined with marketing.)

As at present the illiterate and inexperienced cultivator is not in a position to deal with the ultimate consumer, the co-operative commission shops, to begin with, have taken the place of the grain market *arhati* and have undertaken the marketing on sound business principles of the produce of cultivators on commission. (The shops deal in *Kachi Arhat* business only). They aim at getting a fair price for the cultivators' produce at reasonable commission charges and endeavour to save him from the profits of the village grain dealers and the losses by false weighing and cheatings which are so common if produce is marketed through ordinary *arhatis*. The commission charged by the co-operative commission shops is 4 annas % less than that charged by the *arhatis* and the net gain to the cultivator in commission and weighing charges, etc., amounts to about Re. 1 % in addition to saving the profits of the village grain dealers and the losses on account of false weighing and cheating.

The commission shops are registered bodies under the Co-operative Societies Act of 1912. Any landowner or tenant is

eligible for admission to membership. For membership the purchase of at least one share is essential. The value of a share is Rs. 25 or 50 and is fully paid up. An individual can buy shares worth Rs. 1,000 at the most, and societies up to Rs. 5,000. The liability is limited to twice the share value. The institutions within their liability enjoy a cash credit with the central financial institutions of their districts. Full authority is vested in the general meeting which is held at least once a year, and elects a Managing Committee to control the business of the institution. From the Committee a chief Director is elected to control the paid staff, which consists of at least one Manager and one Accountant. The by-laws allow 75 per cent. advances against the value of produce stored by the producer in expectation of higher prices. All sales are "ready" unless ordered otherwise by the producer. After defraying the running expenses and carrying one-fourth of the profits to the reserve fund, the profits are divisible up to 8 per cent. on shares, and the balance can be distributed as a rebate, in proportion to the produce marketed through the institution by the members. At the pressing demand of members an amendment allowing small incidental loans (never exceeding Rs. 50 in value) has been introduced in some societies. A binding rule putting members under compulsion to sell at least a definite portion of their produce each year through their shops, has been passed by some of the shops. Its value lies in its application and practice; it has for years been accepted in North America, and is being introduced in England in all sale societies organised by the National Farmers' Union.

Co-operative commission shops have given the cultivator an insight into the science of marketing. His connection with the shops has made him wiser and he has begun, in some degrees to realise the former waste. He will now always make a calculation before selling his produce in his village or in the grain market. His knowledge has decreased the margin of profit of the village grain dealer and he is now obtaining better prices than in the days of his total ignorance of business affairs. The discussions in general and committee meetings have broadened his outlook and have led him to practice economy in other directions. Besides this, the commission shops supply to their members improved seed, implements, etc., and in this way help in improving the quality and lessening the cost of production.

The field for expansion appears to be great and hopeful but the way is stony and beset with difficulties. The dearth of competent managers, the lack of foresight and disloyalty of members and the opposition of the well established and experienced grain-dealers and *arhatis* are the main difficulties. Co-operative commission shops aim at a radical change, the replacement of a deeply established evil system and a revolution in the matured habits of the cultivator who is accustomed to sell in his own village. Such changes cannot be brought about in a day but

require time and patience. For propaganda, the main instruments are teaching and persuasion. The village grain-dealer and the *arhati* who are to suffer most by the development of such institutions have their machinery for propaganda well established and tempting to the cultivators. Further it requires constant efforts to win over the influential zamindars, many of whom are working as agents of the *arhatis*. Thus the task is not easy for the small group of advisory officials and of enthusiastic rural co-operators ; the time is ripe for public benefactors and influential people to take up the work honestly and with enthusiasm and to strive for the solution for the vital problem of marketing agricultural produce, a problem as important for the Punjab as for India, the solution of which will certainly add a step to the ladder of real self-government. Here too the school master can lend his influence to a great extent in explaining and organising.

SUMMARY OF A PAPER ON CO-OPERATION AND MORAL IMPROVEMENT AS LEADING TO SELF-GOVERNMENT.

BY M. BASHIR AHMAD,

Educational Inspector, Co-operative Societies.

The word 'Co-operation' implies a society or an association of individuals to secure a common economic end by honest means. This form of organisation differs radically from Joint-Stock concerns. It stands for self-help and self-reliance. Its chief aim is to ameliorate the condition of the poor. The success of the co-operative movement is not to be measured by the number of co-operative societies but by the moral condition of their members. Education is the bed rock on which we build the edifice of co-operation. Co-operation develops the sense of responsibility and true patriotism. The motto of the co-operative movement is 'Each for all and all for each,' and the practical recognition of this motto promotes national solidarity.

Co-operation in the Punjab has succeeded in eradicating the evils of litigation to an appreciable degree. Members of a great many co-operative societies now settle their quarrels among themselves or by arbitration. Co-operation has given a great incentive to education in villages, and has popularised compulsory primary education among the members of co-operative societies. Co-operation has helped to do away with bad customs, and co-operators have taken active interest in the social life of the poorer classes, who spend far less money now on marriages and other ceremonial occasions. The man in the village is gradually developing a sense of citizenship and with intensive co-operative work it should be easy to arouse his interest in the government of his country.

INDIVIDUAL SCIENCE TEACHING.

By DR. R. H. WHITEHOUSE, D. Sc., I. E. S.

One of the greatest tendencies in modern educational method is the revolt against what is called mass instruction, and the recognition of the superiority of individual treatment. It is recognized that

(1) all pupils are not endowed with an equal degree of intelligence,

(2) advance in intelligence is not even according to age either in individuals or in the mass; mental and physical influences have their effect on progress of the child's mental activities—mental shocks or illness or home influence would influence the child's mental development for varying periods, according to the intensity of the shock or illness. Some children advance rapidly in early years and become 'precocious' while others advance slowly and may even be "dull" during their early years; the precocious child may, later on, show a marked check and finish school as very ordinary or even dull, while the slower child may, with age, improve rapidly and finish brilliant,

(3) it is unwise to force pupils beyond the rate at which they progress normally and it is unfair to hold back the bright pupils,

(4) a pupil learns most easily through self-effort. Lessons in which the teacher does most of the work by demonstration and lecturing will have far less permanence than lessons in which the pupil himself has been the worker and performer.

These matters may have been recognized for a long time, but the teacher, until quite recently, has regarded the attempt to treat his class as composed of individuals as impossible. The Dalton Laboratory Plan has shown the way to effect the desirable reform of individual teaching and although some of us may not be prepared to adopt the system entirely, we at least might consider how something might be attempted in that direction.

In practical science teaching, it can be attempted, and I propose to outline a method of procedure which can be carried out in any High School:—

1. In the first place the complete course is mapped out into a series of "Assignments" of work.

2. The first assignment is given to all the pupils some time before the practical period—it may be a few days. A typical assignment consists of (a) Preparation and (b) Laboratory work; both these parts are based on the pupils' text-book. In the preparation the pupil's attention is directed

- (i) to the part of the text-book which should be studied,
- (ii) to difficult parts; the difficulties are eased either by a

re-statement of the points involved or by further illustrations

(iii) to a series of questions designed to test (a) the comprehension of the book and (b) whether the pupil has actually read the text prescribed. Such questions must be answered in writing,

(v) to references in other books—generally of a readable nature—which deal with the subject. Such books need to be duplicated to the extent of 6 copies in the library.

When, and only when, the teacher is satisfied that this preparation has been properly done, is the pupil allowed to begin his laboratory work. To make this supervision possible, the amount of written work in the preparation must be limited and questions so designed as to involve only the shortest of answers.

As regards the practical period, the pupils will come provided with (1) their answers to the preparation, (2) their laboratory note-books, and (3) their text-books.

Without any instructions from the teacher, they will immediately begin work according to the instructions contained in the assignment. The assignment therefore includes, in brief, all that a teacher ordinarily would find it necessary to say during a practical period. The assignment also gives hints as to the method of making records of observations and conclusions.

Pupils will start and continue to work entirely on their own, first getting all necessary apparatus themselves and fitting it up themselves.

The teacher spends his whole time in the most thorough supervision, continually moving round the class, commanding, advising, consuming as he finds necessary.

When an assignment is finished, the pupil must bring his record to the teacher who will pass or reject it, and when it is passed as quite satisfactory, the pupil proceeds to the next assignment.

Thus after a short time different pupils will be at different places in the course and an economy in apparatus is effected. The teacher can then give special attention to the slower pupils and encourage them to make headway.

In the laboratory is hung a Progress Sheet showing the progress of each pupil and this is an incentive to steady work.

It is admitted that it is a gigantic task to write out good assignments and not every teacher is able to do this work. It was to relieve the science teacher of this hard work that I decided to write a full set of assignments for the Matriculation course; with the assistance of my wife this was accomplished.

Now assignments can only be written round the text-book and for this purpose I chose what I consider to be the best Elementary Science text-book yet written for Indian schools, viz., "Experimental Science for Indian Schools" by Gregory and Hodges (Macmillan and Co.), price Rs. 3. I consulted all other books written for Indian Schools, but I found that this book by Gregory and Hodges contained few or none of the faults met with elsewhere, e.g., bad English, wrong facts, poor printing, poor diagrams and inferior general get-up.

The books I therefore recommend are:—

- (1) Experimental Science for Indian Schools, by Sir Richard Gregory and F. W. Hodges (Macmillan and Co.) Price Rs. 3.
- (2) Assignments in Practical Elementary Science (based on the above). By R. H. Whitehouse and Mabel Whitehouse. (Macmillan and Co.) Price 2-8-0.

I specially commend to your notice the demonstration in the assignment method which will be given in the C. M. School at 10 A. M. on Wednesday. I hope all inspectors will be present. At this demonstration boys will be allowed to choose any assignment, but none will have worked the subject previously from the assignment book.

"SUGGESTIONS FOR THE TEACHING OF NATURE STUDY IN SCHOOLS."

BY PROFESSOR G. MATTHAI, M. A., F.Z.S., F.L.S.

Last May, before a meeting of the Punjab Association of Science Teachers, an opportunity was accorded me of entering a plea for the teaching of Biology in schools. I then ventured to base my argument on the value of Biology in helping boys and girls to observe accurately and discriminately, to exercise their brains and draw inferences from observed facts, to guard against the commoner diseases, to learn to use their hands, to understand the fundamental laws of life and to appreciate something of the beauty of Nature. That plea seemed to meet with the approval of the Association, and this afternoon I am called upon to make suggestions for the teaching in schools of Nature Study which has an ampler scope than Biology, embracing, as it does, both living and non-living objects. My brief paper of 15 minutes will be desultory and cannot be as profitable as a series of lessons.

Whether it be Biology or Nature Study the first desideratum is the right type of teacher who will inspire love and enthusiasm, in the pupil, for the subject which is of a particularly difficult

character to teach especially as an intelligent appreciation of objects in Nature is more important than the knowledge itself. This sounds a commonplace, nevertheless the problem is serious and urgent.

If Nature Study is of primary importance to the growing boy and girl, we may put ourselves the question whether it should not form an integral part of the school course. However, on turning up the pages of the Punjab University Calendar I see no mention made of Nature Study, and apparently it is quite neglected in our schools.

The discipline of Nature Study, unlike that of elementary Experimental Science, is perhaps less severe, but quite as effective in training the eye, intellect and hand. But it has the advantage of having an aesthetic aspect, which should not be lost sight of in a scientific handling of facts. A scientific and aesthetic appreciation of Nature is the aim. In Nature Study pupils should be encouraged to observe, collect, draw and describe. A minimum of equipment is all that is required. A pair of forceps, a net, collecting bottle and a knife and hammer, and even these need not be used except when absolutely necessary.

Under animals I would include the familiar forms—mammals, birds, reptiles, frogs and toads, fishes, snails and slugs and other shelled forms, insects, spiders, scorpions, centipedes, millipedes, prawns, crabs, earthworms.

Similarly the common flowering plants, trees, and vegetables may be studied with special reference to leaves, flowers, fruit, seed and root.

Non-living objects might comprise rocks, minerals, sand, soil, hills, rivers, rain, clouds, weather and its effect on plant and animal life without venturing on agricultural technique.

Nature Study is dependent on local conditions. It is, therefore, necessary that the teacher should acquaint himself with the animals, plants and other natural objects in his particular locality. They may be more botanical or zoological or physiographical as the case may be ; but it is useless to refer to things that the pupils have no chance of seeing. Schools in rural areas would have an advantage, in regard to Nature Study, over those in towns. Lahore, however, is particularly fortunate in this respect, as there is no better place for Nature Study than our public gardens with their variety of plant-life and the zoo with its animal life.

Nature Study is also dependent upon the seasons, especially in the Punjab with its extremes of climate. Nature Study in winter cannot be the same as in summer. Take, for instance, butterflies which are entirely absent in the cold months but abundant in the late spring and summer.

Pupils should be encouraged to keep diaries in which they should record every week any seasonal and other changes that they notice in the fauna, flora and physiography of their locality. Their records should be checked by the teacher.

Animals and plants should, as far as possible, be studied alive with reference to their shapes, colour, build, environment and, in the case of animals their movements and habits.

Outdoor work should be supplemented by indoor work. That is to say the teacher may give lessons in Nature Study in simple language avoiding all technical terms, mainly by means of questions and answers. If the teacher is not able to answer all questions, he can learn along with his pupils, for the field of Nature Study is endless. Pupils should be asked to draw and describe the more interesting objects that they collect, for drawing and description help to give precision to what the pupils observe.

What I mean by lessons may be illustrated by reference to that immortal 'beast,' the Frog. Pupils may be asked to point out the main parts of its body, *viz.*, the head, trunk, arms and legs, its natural posture should be noted, its colour, the slimy skin, how it moves. A comparison and contrast may be made between the frog and man. Both have the same essential parts but while man is bipedal the frog is quadrupedal, while man is hairy the frog is not, the former warm blooded the latter cold blooded, man's digits are free while the frog is web-footed, the one amphibious, the other terrestrial, and so on. The life-history of the frog can also be elucidated by means of questions—the egg, tadpole and finally the frog. In the case of a fish, the shape of the body is adapted to an aquatic life, quite different to that of the amphibious frog and the terrestrial man—fins, scales and gill-openings are present. The bird again is unlike all these, with its wings and features and beak and aerial habits. The butterfly has wings and is aerial like a bird and beautifully coloured, but how different in all other respects! No feathers, nor bones but 3 pairs of legs, and its life-history—egg, free-feeding caterpillar, pupa and finally the butterfly—although essentially similar to that of the frog—is yet strikingly different.

Take care, however, by your lessons, not to tire or bore the child. Lessons should be carefully planned to avoid discursiveness and to maintain continuity in teaching.

In Nature Study, general principles should be kept in mind by the teacher and the courses arranged for the different grades of pupils, according to their capacity for understanding facts, for the discipline of hand, eye and mind, and for aesthetic appreciation.

The utilitarian aspect of Nature Study should not be lost sight of, by the teacher, for a knowledge of crops, cattle, insect, pests, etc., has much practical value in our agricultural country.

A school garden—on the common garden type, or plot garden type or a combination of both—is a necessary and useful adjunct. How much gardening each pupil is to do, the size of the garden, and what plants and vegetables to grow should be left to the teacher.

A school aquarium can also be easily rigged up, in which various aquatic animals, particularly insects, and plants can be kept. These should be collected by the boys themselves who should watch them from day to day and understand their growth and the inter-relationship of plant and animal life.

The more interesting objects collected by pupils, that cannot be kept alive, may be stored in the school Museum, such as butterflies, shells, birds' feathers, etc.

From all this it follows that there should be a certain elasticity and poise in Nature Study. It should not be made too much of a scientific task, nor too practical nor too emotional.

In that admirable book of 6 volumes on Nature Study, edited by Prof. Farmer, the first chapter by Prof. Arthur Thomson begins as follows :—

“ It may be useful to teachers to point out that the Naturalist asks four chief questions—the first question is,—*What is this?* an inquiry into *form* and *structure*. What is this living creature in itself and in its parts? What is it as we see it with our own lenses only and as we see it when we put other lenses in front of ours? What is it as a thing by itself, and when compared with its fellows and kindred?

The second question is,—*How does this act?* an inquiry into *habits* and *functions*. How does this living creature behave as it does? What is its business? How does it keep agoing and set other creatures like itself agoing? How does it go on? What is the “particular go” of it?

The third question is,—*Whence is this?* an inquiry into *development* and *history*. Where did this living creature come from? How did it begin? What was it like when it was young? What are the chapters in its growth, and the crises in its life-history? What is known of the history of its race?

The fourth question is,—*How has this come to be as it is?* an inquiry into *causes*. What factors have led to this living creature being what it is, where it is, as it is; in short, what have been the factors in its evolution?

Now, it need hardly be said that these questions cannot be answered to children, though, as a matter of fact, children are continually asking them! They are the fundamental questions of the science of biology, which is not for children. But it is the teacher's business to have clearly in his mind what the fundamental questions are, to make himself acquainted so far as may be with the partial answers that are at present possible, and to understand the method of arriving at these. He will then be able to encourage his pupils to put these questions, and, while recognising the impossibility of answering them fully, to guide them to find out provisional answers for themselves, answers which, though they may not go far, must yet be true as far as they go. This is the only and true method of instruction in Nature Study."

I commend these words to your consideration.

THE POSSIBILITIES OF PLANTATION AGRICULTURE IN INDIA.

BY S. BANERJI, B.A., B.Ed., MALERKOTLA COLLEGE.

The importance of modern means of communication to the farmer is suggested by the statement :—

"Whereas wheat may be profitably carried by rail and water a distance of 15,000 miles from the United States to a European seaport it can rarely be grown with profit west of Lake Michigan, more than twenty miles from a railway." Storage is not less important. Great elevators are erected near rail, river, canal or lake which store 100,000 to 2,500,000 bushels. A ship's cargo of 200,000 bushels can be unloaded in two hours. Cheap and rapid transport has brought the whole world into mutual dependence. A short crop in England is made up by heavy yields in America or Australia; a famine in India is abated by Egyptian supplies.

One of the latest and most striking phases of the development of resources is the effort to secure the plants and animals best suited to flourish in the differing soils and climates of the world. Trained scientists first make careful studies of the climates and soils; engineers expend vast sums in draining the swamp or irrigating the desert; botanists search the whole world to find plants growing in just those conditions of climate and soil and secure at great cost and trouble the seeds and cuttings for the new land that awaits them; farmers patiently

experiment and finally produce fruits or foods where Nature seemed determined no man should live. Thus an enterprising and wealthy country like America brings into profits its deadly swamps and its parched deserts, through Plantation Agriculture.

Let us look around us to understand the splendid achievements of other countries in plantation agriculture. A few years ago a writer in a popular American magazine said "The secret of the success of the little Daybreak Kingdom has been a mystery to many students of nations. Western nations will fail fully to grasp the dynamic intensity of Japan of to-day, and will dangerously underestimate the formidable possibilities of the greater Japan the Dai Nippon of to-morrow, until they begin to study seriously the agricultural triumphs of that empire. For Japan, more scientifically than any other nation, past or present, has perfected the art of sending the roots of its civilisation enduringly into the soil." With all her advancement in manufacturing industry and oceanic commerce, Japan, it must be noted, is still an agricultural country. In the ancient social policy of Japan the farmer occupied the second place being next to the Samurai. And to-day of the 45,000,000 population of Japan 30,000,000 are farmers. It is the farmer which is the chief source of public finance. The land tax supplies the major part of the Government revenue. In 1881, the land tax amounted to 43,000,000 yen (1 yen=Re. 1 annas 8) out of the total taxes of 60,000,000 yens. During the period of national isolation when the ports were closed to foreign trade, and importation and exportation as well as immigration and emigration were prohibited the people were thrown entirely upon their own resources and were obliged to produce their own food. The country being a hilly one, the arable land constitutes only 15·7 per cent. of the whole area of the empire (exclusive of Formosa). About $\frac{1}{5}$ of this arable area is devoted to pasturage, and the rest forms the paddy and the upland fields for mulberry and tea plantations. This small portion of the country has had to support a thickly settled population. An intensive system of cultivation has been a necessary development. The Government has also lavished money and lent active support. Abolition of Feudalism and Law of Agricultural Societies have been great incentives to plantation agriculture in Japan. In January 1900, the Government also introduced a Law for the adjustment of farm lands. By this law farmers were compelled to exchange farms with each other so that each farmer might have as much of his holdings situated in one place as possible. Before this the different farms of the same family were scattered about, entailing much waste of time and space. Now the productive power of the land of a farmer thus treated has been increased at the average rate of 5 per cent. Agricultural Banks and Credit Societies, Agricultural Education and Experiment Stations are other useful reforms in

Japan. The following table showing a typical Japanese farmer's yearly income speaks for itself :—

		Production per acre.	Current price per bushel.		Total product of 5 acres in money.		The cost of production.	
		Bushels.	Yen.	Sen.	Yen.	Sen.		
	..	37	4	00	740	00		
Wheat	..	19	2	50	237	50		
Incidental advantages	..	..	..	..	10	00		
			Total		1017	50		
							Yen.	Sen.
Taxes	..	..	..	..		..	30	00
Wages	..	..	..	..	..	..	59	00
Manures	..	..	..	..	..		20	00
		Net gain	Yen. 908	Sen. 50	Total		109	00

In 1890, the net income of five-acre farmer was 114 yen whereas now it is 908 yen.

It is to be noted that (if rice may be compared with wheat) the product per given area is greater in Japan than in any other industrially advanced countries :—

Country.	Production per acre bushels.
Great Britain	34
France	23
Germany	27
U. S. A.	14
Japan	37

That Japan is not now able to feed all her children is due not to agricultural decline or stagnation, but the want of suitable land in proportion to the growth of population.

Nearer home, in Java, the application of science to plantation agriculture has made her sugarcane industry the best model in the world. During the last years of the 19th century the planted area increased till at the present day a tenth part of the total area of arable land available in the island has been taken up by sugar plantation.

The following figures show at a glance its steady progress :—

Year.	Total produce in tons.	Year.	Total produce in tons.
1826	1,223	1900	744,257
1830	6,710	1910	1,273,420
1840	47,040	1915	1,303,045
1850	86,519	1916	1,498,567
1860	135,153	1917	1,560,000
1870	152,595	1918	1,778,345
1880	216,179	1919	1,749,408
1890	400,000	1921	1,550,000

Thus the cane sugar production of Java in 1900 had nearly doubled that in 1890 (i. e., in ten years), and in another ten years (in 1910) it became three fold. This sounds like a miracle. But sometimes truth is stronger than fiction. Under the impulse of capital and fostered by scientific research and application of the results thereof, the husbandry has been built up from a few thousand tons to one million and a half tons, making Java, the second largest tropical sugar producing section in the world, in spite of the fact that the soil is very poor, far inferior to that of the Philippines. Largely by fertilization they have doubled the sugar-crop without greatly increasing the acreage.

Another touch of the magic wand we find in the sugar plantations of Porto Rico (U. S. A.) In Porto Rico. 1897, there were exported 127,000,000 lbs. of sugar, while in 1902-03, the amount had increased to 283,000,000 lbs., and in 1909, 408,189,000 lbs. were exported bringing in 14,770,650 dollars. The area of Porto Rico is only about 3,668 sq. miles, i.e., in round numbers, 233,000 acres. Of this 174,194 was the cane acreage in 1906-07. Porto Rico has to-day 129 sugar factories with a capacity for grinding cane ranging from 1,000 to 10,000 tons per day. What is more wonderful is that it has been so long under cultivation without fertilization of any kind, and until recently there was less than $\frac{1}{4}$ under cultivation, although every foot of land is tillable.

Japan promotes the sugar plantation of Formosa and has made it one of the best sugar growing centres of the East. Up to 1910, Japan imported the major part of her sugar from Java, but now it is the aim of her statesmen to raise all the sugar by plantation agriculture in Formosa. In the first decade of this country, such large shipments of sugar machinery have been sent to Formosa from Great Britain, America and Germany that as soon as all these factories have begun to give their maximum amount of cane the production of sugar must run up to a considerable height.

The United States Department of Agriculture, the experiment stations and agricultural colleges scattered all over the land, even the farmers themselves, have made a business of studying wheat-growing from the standpoint of plantation agriculture, and to-day the tillers of the soil of no other nation have so thoroughly mastered all the details of the successful cultivation of this grain. One of the first points to which the wheat-grower of America gives his attention is the proper preparation of a perfect seed-bed for his wheat. A deep, loose seed-bed is considered to hold too much water, while it also is liable to cover the seed too deeply. The secret of the compact seed-bed was learned in America quite by chance. In the early part of the last century the farmers were in the habit of turning the plough on the ploughed land instead of on the unploughed soil. It was noticed that invariably a strip of ten or twelve feet, on what the horses tramped in turning, produced stronger growth and thriftier plants than any other part of the field. It did not take the agriculturists long to figure it out that the wheat grew better on the trampled strip because the soil was more compacted there by the horse's hoofs and this suggested the modern method of compacting the ground for wheat. It is also a common practice in America to burn the stubble off a wheat field before ploughing it. This results in a stronger, better crop, destroys all weeds and foreign grasses and also effectually disposes of the cutworms that cause considerable loss to wheat growers.

Strips of paper, three feet wide and less than one-thirty-second of an inch in thickness have increased the production of pine-apples in the Hawalian Island by more than 40 per cent. Laid in a field of sun-grown Sumatra tobacco in Florida, the same kind of paper increased production more than 50 per cent. Papering fields of tomatoes in California raised their yield by some sixty per cent, while strawberries, their roots so protected, produced forty per cent. more berries than the same varieties planted in an equally good neighbouring but unpapered field. The device is the discovery of C. F. Eckart, the Burbank of the Hawalian Islands. The paper has also been applied with success to sugarcane and grapes in these Islands. The paper virtually puts every plant root into a forcing hot-house. The roots are kept shaded, heat is retained as is also moisture, the combination necessary to the greatest root and plant growth, and weeds, being unable to pierce the paper covering, cannot grow. The use of the paper by this combination of retained heat and moisture, has extended the area in which pine-apples can be produced profitably to higher altitudes and colder temperatures. Surface evaporation from the area covered with the paper is virtually negligible, the moisture being conserved entirely for the use of the plant. This eliminates the undesirable and often disastrous caking and craking of the soil. Some of the papers used are perforated with many small holes, so as to allow moisture from rain, dew and fogs

to seep slowly through, increasing the moisture so stored beneath the paper.

Another reform of America in the matter of plantation agriculture is scientific seed breeding. The use of improved and new breeds suited to particular localities is estimated to be capable to adding from three to nine rupees per acre to the value of 100,000,000 acres of cereals. This means an increase of Rs. 300,000,000 to Rs. 900,000,000 in the value of this crop in the United States.

The application of fertilizer is also an important question. A great many farmers depend upon farmyard manure, but many more use commercial fertilizer. As small an amount as 100 pounds applied to an acre has been known positively to double the crops.

Germany. Germans increase crops by fertilizing the air. That plants, through their leaves, feed upon the carbonic acid of the atmosphere, besides other elements taken up out of the soil, has long been known. German chemists in iron factories used purified carbonic acid in greenhouses. The plants treated with the gas showed a more vigorous growth than those in an adjacent greenhouse. The field of tomatoes was increased 175 per cent. and cucumbers 70 per cent. At the same time experiments were also made in the open air on square plots around which punctured tubes of carbonic acid gas were laid. Here an increase of 150 per cent. in yield of spinach was reached, 140 per cent. with potatoes, 134 per cent. with lupines (a legume), and 100 per cent. with barley. Other experiments proved that this fertilization of the air is far more effective than that of the soil, even though the latter be on a liberal scale. Fertilizing the soil alone gave an 18 per cent increase; but soil and air fertilization together gave an 82 per cent. increase. Will not our Jamshedpur take the hint?

Australia. Australia is another example of how waste land may be converted into smiling gardens of vast wealth through plantation agriculture.

India. Let us apply the facts and figures available from experimenters in other lands to conditions in our own country. Then we shall realise the immense potentialities of her plantations, and the possibilities of immeasurable wealth. Plantation—a form of industry to be found extensively in most of the tropical possessions of European countries—was the first to be introduced by the Europeans into India, especially during the years 1860–70, as evidenced by the growth of the tea, coffee and jute industries. The indigo plantation is an exception to the above statement, for the growing of indigo by European planters began in India before the end of the eighteenth century. Indigo had been grown

in India from ancient times. The planters in Guzerat and Western India failed in competition with America and also on account of adulteration of the dye. The East India Company revived it in Bengal with planters from the West Indies. It thrived well for the first half of the 19th century. The system on which indigo was cultivated was not strictly a plantation system. So, by 1860, Indigo had grown to almost the maximum of its capacity and henceforth it remained almost stationary.

Tea plantation in India began much later than indigo. The indigenous tea plant growing in a wild condition in Assam was first discovered about 1820. The attention of the East India Company was directed towards it, and an experimental garden was opened in 1835. In 1840, the East India Company made it over to the Assam Company, the first Indian Tea Company. Up to 1852, the progress was almost nil. In this year, a private tea garden sprang up and then a number of tea plantations adorned Assam. From 1859 the rate of growth was amazing, both in the number of estates and the out-turn of tea. The following are the figures for Assam :—

Year.	No. of tea estates.	Area under cultivation (acres).	Outturn of tea in lbs.
1850	1	1,876	216,000
1853	10	2,425	366,700
1859	48	7,599	1,205,689
1869	260	25,174	4,714,769
1871	295	31,303	6,251,143

The figures for 1869 do not clearly show the feverish growth which took place in tea plantation during 1859—66. The estimates formed by everybody of the future of tea were extremely rosy and, with the relaxation in the rules under which grants of land were made, the way of the speculator became extremely easy. During the speculation craze the demand for more labour became insistent and coolies had to be imported from Bengal and Behar to meet the demand. Bad method of transportation of coolies, dishonesty and mismanagement told heavily upon the tea-gardens during 1866—1869. By 1871, tea cultivation was placed on a firm basis. It spread to other parts of India, such as the Punjab (Kangra) and the Nilgiris.

Coffee was first introduced into India by the Moor traders in the 17th Century, and coffee plantations were started in many parts of South India. The first coffee garden was planted by a European in 1840. It was not till 1860, when causes, such as the decline in coffee cultivation in other countries, helped towards rapid progress of the industry. The *Mysore Gazetteer* says, "Since 1860 estates have sprung up between these points (in the Kadur district) with such rapidity that European planters

are settled in almost a continuous chain of estates from the South West of Shimoga to the southernmost limits of Manjarabad, not to mention Coorg and Wynaad beyond." (Vol II, page 375, 1897). During the first decade after 1860 alone the exports of coffee increased nearly ten-fold and the same rate of increase continued till 1879. From 1860 to 1879 was a period of continuous progress for the coffee industry. Labour was imported from the neighbouring districts. With the investment of European capital begins a new chapter in plantation agriculture.

The area under cotton had also increased steadily. This increase in area was chiefly due to the increase in the proportion of land occupied by cotton in the cotton tracts. Jute was even more largely restricted to a particular area—Bengal—than cotton. But the proportionate increase in the area under this crop had been even greater. These are only a few examples. The introduction of new varieties of rice was tried with success in some parts. From the monsoon areas, plantation of rice has spread to clothe many other parts of the earth. Not only Egypt, inundated by the Nile, but even the Plain of Lombardy in Italy with the help of irrigation, gathers very rich harvests of rice. It is also an agreeable surprise to learn that America has recently established rice plantation chiefly in the coastal and river lowlands in the south of the United States, and still more recently in British Guiana. "The great food value of rice makes it probable that still further developments will take place, since, as a map may show, the possible area of cultivation may be so widely extended." Is it, therefore, very difficult for us to conceive that the possibilities of rice in untouched river-valleys and canal colonies of India—its natural home—are practically unlimited?

Improved and early growing varieties of ground-nut suitable to the foreign market were introduced into cultivation. In the latter matter, the experiment most successful was the introduction of ground-nut cultivation into Upper Burma. Apart from improvements in the crops, experiments were made in improved implements and artificial manures.

The vast resources of India, for example, her water-power, forest wealth, canal irrigation, shy capital, waste land, and unemployed labour, which until very recently remained idle, are now being turned to profitable use. Professor Sohan Lal of the Central Training College, Lahore, has already brought to the notice of the educators in the Punjab, the possibilities of great enhancement of value of fields and forests in the Punjab when the excellent projects like the Mandi Hydro-Electric scheme, the canal irrigation and date-palm cultivation will be accomplished. I invite brother-teachers in other provinces of India to study these articles that appeared from time to time in the *Punjab Educational Journal*. The employment of water-power is indeed a great incentive to plantation agriculture. In spite of the

enormous development within recent years, only a comparatively small use has yet been made of the world's available water power. The proportion between applied and available power of certain countries is as follows :—

England	..	as 1 to 8.
France	..	as 1 to 8.
Spain	..	as 1 to 10.
Italy	..	as 1 to 4.
Canada	..	as 1 to 10.
U. S. A.	..	as 1 to 4.
Norway and Sweden	..	as 1 to 5.

This estimate was taken a few years ago, and though many plants have been installed, there is still a vast amount of power available.

Many of you are now familiar with the Mandi Hydro-Electric Scheme. When completed it will help plantation agriculture in the Punjab to an enormous extent. Vast areas of waste land, with splendidly fertile soil, not reached by the canals or situated at a much higher level than the canal water will now have plantation grown on them, for the cultivators will now employ the cheap electricity of Mandi to draw up water for irrigation by means of tube wells. Again, the water-logged fields not only lie idle but breed germs of diseases which take heavy toll of victims in men and cattle. It is estimated that the cheap electricity will drain and re-claim some 50,000 acres of water-logged land for plantation agriculture. The excess of water also will be profitably used where there is need of it. Plantation agriculture in the Punjab is still in its infancy. Java produces 4 times as much sugarcane per acre ; Egypt yields nearly three times as much cotton as the Punjab per acre. Artificial fertilizers like ammonium sulphate are a great aid to plantation agriculture. The Mandi electricity will be used to make these products, and sugarcane and similar other plantations will spring up here and there, at comparatively cheap cost. Electric tramways and other cheap means of communication will open new markets and create wider demand for the commodities of the agriculturists.

Even in far-off Mysore, the Hydro-Electric Power at the Siva Samudram Falls has brought thousands of acres under plantation cultivation. Electricity is developed from water flowing down 420 ft. It is now about two decades old, and the entire credit lies with the late illustrious Sir Seshadri Iyer, Dewan of Mysore, a pioneer in the line among Indians. His Highness the Maharaja some years ago sanctioned a scheme for adding another 50 per cent. to the water power. To ensure the object, a huge dam, 124 feet high, has been thrown across the Cauvery River at Kaunambadi. It will impound over 31,000,000 cubic feet of water in a lake from which water will be carried in a channel to the works at Siva-Samudram. A high level canal is also to be dug to enable 10,000 acres of land now lying barren, to be brought under "wet"

cultivation. At the western frontier of Mysore there are the Gersoppa or Jog Falls, (900 ft.) the highest in the world, which, when harnessed, will give the State 100,000 horse power of electricity. Mysore has shown to the rest of India how to utilise foreign technical skill to make India self-sufficing.

The canal systems of India, particularly of the Punjab, are another wonder-worker. The great advantage of irrigation is that the danger from the vagaries of the seasons is very greatly minimised by it. Bengal, though richly gifted by Nature, suffers from flood and famine, for there may be no rainfall when it is urgently needed or there may be heavy downpours when not a drop is wanted. But the Punjab is free from this uncertain nature of rain. Irrigation not only makes directly for greater prosperity, but prevents almost all the bad effects of famine. It encourages plantation agriculture by having canal colonies opened in waste lands. It also encourages the agriculturist to sink his capital in the land by taking away the fear of an uncertain rainfall. A comparative steadiness of return and the high rents and other charges induces the cultivation of the more remunerative and specialised crops, and makes agriculture more intensive. It helps the movement of commercialization of agriculture, and very definitely encourages the tendency of growing for the market as against growing mainly for home consumption.

The following table regarding cultivation (in acres) in 1921-22 is worth close study :—

Province.	Forest.	Not available for cultivation.	Waste-good land but not used.	Cultivated and fallow.	Irrigated.
Madras ..	13,000,000	21,500,000	12,200,000	43,000,000	9,500,000
Bombay ..	8,500,000	5,800,000	1,000,000	35,000,000	1,000,000
Sind ..	750,000	13,850,000	6,200,000	9,500,000	3,000,000
Bengal ..	4,250,000	11,500,000	5,800,000	29,000,000	1,750,000
U. P. Agra ..	8,700,000	7,700,000	7,600,000	29,000,000	7,500,000
C. P. Oudh ..	600,000	2,250,000	2,900,000	10,000,000	2,500,000
Punjab ..	2,200,000	1,250,000	16,100,000	29,000,000	13,500,000
Burma ..	19,250,000	55,400,000	61,100,000	20,000,000	1,300,000
Behar & Orissa ..	7,000,000	84,000,000	6,900,000	31,000,000	5,500,000
C. P. ..	14,500,000	4,000,000	14,800,000	19,000,000	1,100,000
Assam ..	3,550,000	5,500,000	13,700,000	9,000,000	250,000

Bengal, the U. P. and the Punjab have each 29,000,000 acres of cultivated land, but good waste land in Bengal is 5,800,000 acres and in the Punjab it is 16,100,000 acres. Again, some 13 million acres in the Punjab gets the benefit of the canals, but Bengal has only 1 million acres. It may be easily concluded that the Punjab has therefore greater possibilities for plantation agriculture than Bengal. The figures will also tell us that Burma, Assam, C. P., Sind and the Madras Presidency are the other Provinces where we can gradually start plantations. The figure for forest

in the Punjab is very discouraging. Afforestation is a desirable reform in plantation agriculture in the Punjab. Even in the low flat plains of Bengal the forest area is 4,250,000 acres, whereas in the Punjab it is half of it.

Let us also study the following two tables :—

Crops grown (in thousands of acres sown) in 1921-22.

Province.	Rice.	Wheat.	Barley.	Millet.	Maize.	Oil seeds.	Sugar.	Cotton.	Jute.	Tea.	Fodder.	Others.	Total.
Bengal	21,832	124	83	1,302	90	1,267	277	48	1,316½	177	104	..	28,160
Bombay..	1,956	1,501	24	12,046	210	903	54	2,835	..	..	1,916	..	26,900
Sind	1,044	432	19	6,980	3	375	7	141	..	..	125	..	4,036
Madras	11,280	23	3	8,770	104	3,373	119	2,006	..	45	306	..	57,562
Assam	4,517	..	..	183	1	339	41	40	81	418	..	..	6,227
Behar & Orissa	15,220	1,134	1,378	154	1,800	1,670	306	79	109	2	34	..	31,594
U. P.	6,847	6,874	4,355	5,345	2,077	696	1,156	807	..	7	1,267	..	44,093
Delhi	..	52	20	86	3	6	7	2	..	..	19	..	324
Punjab	821	8,789	1,112	4,562	1,112	1,665	373	1,149	..	10	4,093	..	31,026
N.-W. F. P.	24	938	298	370	462	198	3	15	..	..	91	..	2,876
C. P.	5,040	2,285	12	2,460	158	1,505	17	1,274	..	..	434	..	18,696
Berar	31	163	..	2,698	4	137	..	3,140	..	..	..	..	6,934
Burma	11,000	69	..	865	233	1,361	35	325	..	4	212	..	16,620

Crops irrigated (in thousands of acres.)

Province			Rice	Wheat	Millet	Pulses	Sugar	Cotton
Bengal	..	..	1,531	14	1	147	62	1
Madras	..	..	8,027	6	600	1,443	107	132
Bombay	..	..	1,219	486	605	334	60	143
C. P.	..	..	949	69	1	7	16	..
Punjab	..	..	625	4,005	682	1,470	326	1,054
U. P.	..	..	349	3,611	28	2,342	852	200

It is clear from the above figures that more than $\frac{3}{4}$ of the Punjab rice depends on irrigation, whereas in Bengal only $\frac{1}{20}$ th. So plantation agriculture of rice in the Punjab Canal Colonies has bright prospects. So also more than $\frac{2}{3}$ of Madras rice rests on irrigation. Thus rice plantation may prosper in this Presidency. The same argument holds good about sugar plantation in the Punjab and Madras Presidency ; and also in C. P.

The particular use made of any locality depends not only upon such physical factors as the rainfall, the temperature and fertility of the soil but also upon human factors such as the supply of sufficiently skilled labour, the organizing of trade, and transport. Growing demand for the product ; cheap railway, river, lake, canal, and sea transport ; nearness of coal mine or hydro-electric power, extensive irrigation and building of harbours are other desirable factors for plantation agriculture.

It is known to teachers and students of geography that wheat is reaped throughout the year in some part of the world or the other. In the Mediterranean region the harvest is reaped in May or June ; in N. Russia at the end of August, in India in February or March. This is an advantage to importers, as it ensures a steady supply and minimizes the effects of bad weather in particular areas. Three regions which have great potentialities for wheat plantation are the south of Russia, the inner plains of extra-tropical Australia and the central portion of Argentina ; all of these being among the richest of temperate grass-lands. For similar reasons, the grass-lands in the rain-shadow of Assam may grow wheat in the future.

The future of wheat in India depends largely on the future course of wheat prices in the world's market. There are at present strong tendencies towards an increase in the world's supply of wheat. Owing to a rapid improvement in the means of transport and a cheapening of its costs, as well as to the spread of good government and the accumulation of capital, there are large

areas, hitherto undeveloped, which are likely to be brought within the range of profitable cultivation within the next few years. In many countries irrigation greatly increased the outturn of wheat, and irrigation is extending rapidly in India. Science and education promise to add considerably to the average out-turn per acre within the next few years. The general opinion among the meteorologists is that wet and dry years come in cycles, and that the next few years are more likely to be wet than dry. The tendency will be towards an increase in the world's production of wheat. Demand also will be great. To a large proportion of mankind wheat is very welcome food, and the more they can afford to buy the more will they buy. There is a rapid increase in the general prosperity and purchasing power of men and so wheat—the staple food—will be much in demand. As supply and demand will keep pace together, there is no fear of fall in its price. The possibilities of wheat in India are therefore very great.

Cotton. Cultivation of cotton in the British West Indies, once considerable, is being revived, and a similar process is going on in Lagos (southern Nigeria); in northern Nigeria, British East Africa, Nyasaland and Rhodesia—the prospects of development of cotton are encouraging. Australia, and more specially Queensland, is another region in which cultivation is taking place. Peru and Brazil are important producers. There are indications that in the rain-shadow parts of Burma, Assam and Bengal cotton plantation is possible. In fact, Bengal was once famous for cotton. So the industry may be revived. That the prospects of the extension of cotton cultivation have been engaging the attention of the agricultural and commercial world is evident even from the names of recent publications like “Cotton in South Africa”; “Cotton in Australia: The possibilities and the Limitations of Australia as a Cotton growing Country” (by R. Harding); (“Report on the cotton growing industry in Uganda, Kenya and the Mwanza District of Tanganyika”; “The extension of cotton cultivation in Tanganyika Territory”; “Cotton growing in Nigeria”); “Iraq (or Mesopotamia) as a source for increasing raw cotton supplies”; (“Cotton in North Brazil together with a synopsis of the whole of Brazil's cotton potentialities”; “Cotton on the Nile”); etc.

Papya. This fruit tree thrives well in moist and warm climates; Bengal, Ceylon, Burma, and Bombay may extend its plantation. We may grow 200 good plants in 1 bigha (80 cubits square) of land. The expenditure in preparing the seed-bed, seeds, manure and fencing the garden is about Rs. 29. The income calculating at the rate of 20 healthy fruits (per tree) at 2 annas each is Rs. 250. So the net income is at least Rs. 200 per bigha. Not even jute fetches us such profit.

Banana. Although many people in the United Kingdom associate the banana particularly with Jamaica and the Canary Islands, not more than $\frac{1}{5}$ of the fruit imported into the country comes from those countries, the remaining 3-5th being supplied by Columbia, Costa Rica and the Republic of Honduras. In 1922, bananas were imported into the United Kingdom to the value of over £5,300,000 of which amount only about £600,000 represented produce of British possessions. In view of the fact that the banana can be grown in most tropical lands where labour is available, I feel tempted to assert my belief in the tremendous banana-growing possibilities of India, Burma and Ceylon.

Eucalyptus. The fact that so much success has attended the tentative efforts put forth in various parts of India would seem to show that the time has come to take up the question of Eucalyptus plantation on a much larger scale than has hitherto been attempted, with due consideration to climatic conditions. Australia owes its immunity from malaria largely to Eucalyptus. I think, therefore, India needs it even more than cinchona. As a matter of fact, among the 140 known varieties of the tree, there are kinds suited to every form of climate from the ocean to the snow lines of the Himalayas. Some will stand any amount of moisture and will drain pestilential swamps and would probably revolutionize the climate of the Terai. Others can endure the most arid regions. Others again are seldom met with more than 50 miles from the sea. The timber, the oil, kino, tannin, bark (for roofing and paper) are highly useful. One kind is frost-and-snow-resisting and is thus especially suited for hill districts. Nurseries should be established in all provinces for the cultivation and distribution of young plants of suitable varieties. The Forest Canal and Railway Departments must be encouraged to established plantations. The Agricultural Farms and Colleges, and District and Municipal Boards should open their plantations.

The Bulletins of the Agricultural Research Institute, Pusa, like "Experiments on the cultivation of sugar-cane," "Directions of cultivation of Eri Silk," "Report on flax experiments," "Wheat experiments, and their bearing on wheat cultivation in the U.P.," "Note on the present position of cotton investigation in India" will enlighten inquirers about the possibilities of plantation agriculture in India.

THE FORESTS OF THE PUNJAB.

BY A. D. BLASCHEK, F. C. H., OEC. D.

Indian Forest Service.

The area of the forests of the Punjab is small in comparison with that of forest in some provinces, but partly for this very reason they are of considerable economic importance. They yield great quantities of timber and firewood, they provide grazing for cattle and sheep, browsing for camels and goats, and the hill forests also ensure a regular supply of water to the large and increasing area of irrigated cultivation in the plains.

The Forest Department now controls about 6,700 square miles of forest or 7 per cent. of the total area of the province; other authorities control further areas and there are extensive areas of valuable forest in some of the Punjab States. The whole area of forest land is not 10 per cent. of the province and more than half of this land is waste, not actually bearing forest growth. In Bengal 14 per cent. of the total area is under forest, in the Central Provinces, 20 per cent., in Assam 41 per cent., in Burma 50 per cent. and in India and Burma as a whole 20 per cent.

In the Punjab three recognized types of forest are represented. The dry forests, the deciduous forests and the hill forests. Their distribution depends largely on rainfall and temperature.

In the dry zone of the Southern Punjab the annual rainfall rarely exceeds 15 inches and most of this falls in the monsoon; in these regions the highest temperatures are recorded and, excluding the hills, the lowest. Such unfavourable conditions account for the small variety of trees and their poor development. As conditions become more unfavourable the forest becomes more open and the number of species still more restricted; the stunted trees are finally replaced by scrub growth up to the borders of the deserts of Rajputana and Sind. The smallest trees develop the most prodigious roots to reach the low-lying ground water, and much land is inimical to the growth of trees owing to concentration of salts in the soil. The most common trees of the dry zone are Karil, Jand and Van, while Farrash on saline soils and Kikar on the river sides must be mentioned.

The deciduous forest is so called because the majority of the trees are leafless for some part of the year and this distinguishes it from the evergreen forest—a type which is not represented in the Punjab. The zone in which deciduous forest grows is intermediate between the dry zone and the Himalaya. The rainfall is 25 inches or more, the mean temperature is rather lower than in the dry forest and the extremes not so great; in consequence both the variety of trees and density of the forest are greater. The Sal, one of the most important trees elsewhere in India in this zone,

occurs only in the Kangra District and eastward in the Punjab, and, as conditions do not suit it, its development is poor. Shisham is the most important tree of this zone in the Punjab though it is by nature most common on the riverside. Valuable forests of bamboo grow in the Hoshiarpur and Kangra Districts and among a large variety of deciduous trees I may mention the Bael, Dhao, Simal, Dhak, Kakon, Amli, Kemal, Behera and Harar.

In the Himalaya conditions vary greatly, but the rainfall normally exceeds 40 inches and the relative humidity is generally high. At an elevation of 2,000 to 3,000 feet the deciduous forest merges into typical hill forest and at the altitudes stated the following trees predominate or are of outstanding importance -

2,000—5,000 feet Chil or Chir.

5,000—8,000 feet Kail and Deodar.

8,000—10,000 feet Rai and Tos.

10,000—12,000 feet Karshu Oak.

12,000—13,000 feet Bhuj, Rhododendrons and Junipers.

Chir is a gregarious species, but in favourable localities it is associated with a variety of broad-leaved trees, and in the deodar and kail zone and at higher elevations a number of trees closely related to European broad-leaved species are found.

Soon after the Punjab became a British province difficulty was found in obtaining timber for public work; exploitation of the hill forests was begun and simple rules for their protection were put into force. A little later the supply of firewood first for the flotilla of steamers on the Indus, and then for railways came under investigation, and with the extension of railways the supply of both firewood and sleepers became problems of increasing importance. The first Conservator of Forests in the Punjab was appointed in 1864 and at about the same time leases of the Chamba and Bashahr State forests were obtained with a view to the supply of deodar railway sleepers. In the plains, forests were reserved for the supply of firewood and a number of plantations on alluvial land were started. However the insecurity of alluvial land and the advantage of more extensive plantations than were possible on the river banks were soon recognised, and planting on a large scale was begun at Changa Manga in 1866. Within 10 years an irrigated plantation of 10,000 acres had been established and it was calculated that firewood could be grown at a cost of four annas per maund, while available supplies from *rakhs* were costing about five annas. At these rates it was impossible to import the equivalent $13\frac{1}{3}$ seers of coal from the coalfields of Central India and Bengal. At the same time there was some hesitation to allot irrigable waste for the purpose since in some cases it had then acquired a value of Rs. 20 per acre.

In the hills the earliest activities of the Forest Department were surveys of existing supplies of deodar. The Himalayan forests were formed into five divisions corresponding to the five Punjab rivers, and it was soon decided that the forests must be worked with a view to future supplies and not merely to meet the requirement of the time. The numbers of deodar to be felled were fixed arbitrarily or by the aid of some simple calculation of the supplies available, and planting was undertaken where heavy felling had rendered natural reproduction improbable. It is interesting to note that at this time the value of a standing first class deodar tree was Rs. 4 and that owing to the limited supply, the use of pine railway sleepers impregnated with chloride of zinc was contemplated. The use of fir and spruce (rai and tos) for other purposes also received consideration.

The earliest forest administration was carried out under executive rules, some demarcation of forests was undertaken, and fellings were controlled, but legislation soon followed the establishment of a regular Forest Department. The provisions of the first forest law in India, Act VII of 1865, applied to the Punjab among other provinces, and the Act which became law in 1878 still remains in force subject to certain minor amendments. There are now 1,299 square miles of reserved forest and 4,372 square miles of protected forest constituted in accordance with the provisions of this Act and under the control of the Forest Department. The leased forest of Bashahr State and 671 square miles of unclassed forest make up the total charge of the Forest Department to 6,700 square miles.

Up to the present 3,550 square miles of forest have been surveyed and working plans prescribing the treatment, outturn and works of improvements are in force over 2,437 square miles. These plans are revised every 10 or 20 years in accordance with the latest silvicultural developments and observation of progress in the forests concerned.

In the last 25 years forestry in the Punjab has developed considerably ; while the railways now burn coal, the demand for firewood for other purposes has increased and with the extension of irrigation the area of natural forest in the plains is dwindling. Already 3,000 square miles of forest have been deforested and of the remaining 2,500 square miles well over a further 1,000 square miles are destined for colonisation shortly. Meanwhile the Changa Manga plantation has amply justified its creation and three similar plantations are already in course of formation ; two on the Lower Bari Doab Canal (at Chichawatni and Khanewal) and one on the Lower Jhelum Canal (at Daphar). Shortly 3 more irrigated plantations are to be started in the Nili Bar on the new Sutlej Valley Canals. These plantations which will cover 130 square miles cannot replace large areas of natural forest in all respects, but the much more rapid growth of trees under irrigation

will to some extent replace past supplies of timber and firewood. All these plantations will be formed with the aid of experience gained at Changa Manga; Shisham will be the species almost exclusively sown or planted and, as at Changa Manga, Tut (mulberry) is likely to establish itself spontaneously from seed borne by birds and water.

It takes shisham 40 to 60 years to attain dimensions fit for timber while 20 years is the normal rotation for shisham and mulberry coppice for firewood. The Changa Manga plantation produces 100 cubic feet, or say 50 maunds of wood per acre per annum. Tut grows faster than shisham and good logs have a very considerable value for all sorts of sports gear. It is debatable whether the new plantations are being formed sufficiently rapidly to meet the demand for firewood when supplies from deforested areas cease; ultimately the area of plantations now contemplated will be insufficient, especially if it is possible to induce the increasing agricultural population to burn firewood and to use their cattle dung for manure.

In the hills the deodar is by far the most valuable species and its reproduction and treatment have received the closest attention. Normally it takes a deodar about 120 years to attain a girth of 7 feet and this is the size it is generally sought to grow; larger trees up to 20 feet and more in girth still occur, but they are becoming scarce. The annual outturn of deodar is now usually fixed by volume after the growing stock has been enumerated and volumes have been assigned to trees according to size. In some cases logs are extracted, but trees are mostly sawn into railway sleepers and building timbers in the place where they are felled; these are then carried by men or by wire ropeways to the rivers. Nearly all the sawing is done in the summer when the hills are quite free of snow and the timber is launched towards the end of the monsoon and reaches the plains depots between December and April. Deodar timber fetches an average price of Rs. 2 per cubic foot and its extraction costs approximately 12 to 14 annas per cubic foot.

The five-needled pine—kail—occurs with the deodar, often intimately mixed with it in the same forest, but also in extensive areas of pure forest at about the same altitude. It has a thin bark and is in consequence easily killed by fires; this circumstance and more or less effective protection from fire in the past 50 years account for fairly general extension of kail throughout the hills. The treatment of kail and its extraction are similar to that of deodar; of the hill timbers it is second only to the deodar in quality but until recent years the demand for it was small. Owing to limited demand and its prolific nature the silviculture of kail has not been the subject of such close study as that of the deodar. In the past its branches were extensively lopped for litter and manure; this is now prohibited so far as possible, but

meanwhile large areas of kail forest have been infected with a fungus which renders its timber worthless. Kail attains maturity in about 100 years and the price of its timber in the plains is about Rs. 1-8-0 per cubic foot.

The three-needled pine, chil, yields the only other timber extensively exported from the hills. Its gregarious nature and heavy fall of needles in the hot weather, as well as the comparatively low elevation at which it grows, exposes chil more than other hill trees to damage by fire. It is provided with a thick bark which often protects the larger trees from destruction, but crops 10 to 20 years old may be destroyed by a single fire and often much larger trees are killed. Chil grows to maturity in about 100 years; its timber is used for a variety of purposes and is now being tried for railway sleepers after impregnation with creosote. Its extraction costs less than timber from the high hills and delivered in the plains it sells for Re. 1-4-0 per cubic foot.

The resin which this pine yields has enabled an important subsidiary forest industry to be developed in the past 25 years. The stems of the trees are tapped by means of grooves cut 6 inches long, 4 inches wide and $\frac{3}{4}$ inches deep and the resin exuded is caught in pots hung on the trees. Throughout the tapping season from March to October the blazes are grooved, or freshened 5 times a month by the removal of further thin shavings until they extend to about 2 feet in length. As each blaze receives attention the exuded resin is collected and packed for despatch to the distillery at Jallo near Lahore. From 20 to 25 blazes yield a maund of resin in a season and on distillation a maund of resin yields some 30 seers of rosin, or colophony, and $1\frac{1}{4}$ gallons of turpentine. The scope of tapping is at present restricted by a fixed rate for collection, packing and delivery at the distillery which is controlled by the Forest Department and a co-partner who finances the concern. About 50,000 maunds of resin are obtained annually from forests under the Forest Department's control and a further 25,000 maunds from the N. W. F. Province and States' forests. At the distillery, plant of the most modern design is employed and the products are of the highest quality. Imports of both rosin and turpentine are a fraction of the total consumption in India and they are dwindling while exports of Jallo products have already attained considerable proportions. The tapping gives employment to a large number of people in some of the less fertile areas of the Punjab, and the industry yields a profit of about a lakh per annum to the Forest Department.

The oaks and broad-leaved trees of the Himalayas are seldom of any but local value owing to difficulties of extraction, but there are estimated to be 800 square miles of spruce and fir forest (rai and tos) which must some day acquire considerable value for the supply of cellulose if not timber; both timbers are being tried as railway sleepers after impregnation with creosote to render them more durable.

Apart from the numerous trees of the Punjab I have mentioned others yield wood for which there is some, but mostly less general, demand and constant efforts are made to find fresh uses for them. Quite recently a match factory was started in Lahore by private enterprise where matches have been made from the bhan wood of Multan and from kail and fir from the hills.

The commercial progress of the Forest Department in the Punjab may be summarised by stating that the annual revenue and surplus of revenue over expenditure were 7 lakhs and 1½ lakhs respectively in the years 1869—79; both have steadily risen and have averaged 41 lakhs and 13 lakhs since 1923. These figures alone do not, however, denote the value of its forests to the province. It is estimated that forest fodder worth 20 lakhs is consumed annually by right-holders free of charge and timber, firewood and other forest produce worth 10 lakhs.

Improved silviculture, better protection of the forests, more complete utilisation of their produce and cheaper and quicker means of its extraction are normal problems of forest management, but in the Punjab the welfare of a large proportion of its population is more intimately connected with good forest management than is generally recognised. Preservation of the hill forests is not merely the concern of those who enjoy rights in them, or of those concerned with the supply of timber or with the financial returns of forestry; the population of increasingly large canal colonies are dependent on the equable flow of water in the great rivers and this cannot be assured better than by maintenance of forest in the hills wherever permanent and profitable agriculture cannot be established. Tree growth stabilises the soil and retards the drainage of water from the hillsides. Throughout the hills there are now instances of deteriorating forest vegetation and erosion of culturable land as a result of excessive grazing and browsing, and destruction of large areas of fertile land by floods which have covered it with sand has followed denudation of the Siwaliks. The vast sums of money invested in irrigation and the very existence of a large population cannot be risked for the sake of the temporary gain of a comparatively few graziers.

In the plains the formation of irrigated plantation to replace the natural sources of wood supply is a matter of more general interest than is commonly realised. Wayside trees provide timber for occasional needs and it is feasible to import some timber from the hills, but there is daily and increasing demand for firewood; occasional trees cannot yield a regular supply nor can firewood be carried long distances at a reasonable cost. It is only suitably situated plantations of considerable area that can avert a fire wood famine when the natural forests of the Punjab plains have been colonised; it is estimated the 200 square miles of irrigated plantation are needed to meet the requirements of the towns alone.

SCIENCE TEACHING IN THE VERNACULAR TO MIDDLE CLASSES.

BY R. S. LALA RATTAN LAL, M. A.,

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The subject of my paper to-day is one in which I have always been keenly interested and of which I made a special study during my 5 or 6 years' work as Science Inspector.

It is not my purpose here to plead for the encouragement of science or even to narrate at length the aims and objects of science teaching. Study of science has caught the imagination of the people of the Punjab and the advance made during recent years is such that the Province might well be proud of. But this enthusiasm for science makes it all the more necessary to review the position from time to time and see that full advantage is taken of the experience gained and lessons learnt here as well as in other countries. Even in England, where we might imagine science teaching to have reached perfection, a searching enquiry held in 1918, by a strong committee presided over by Sir J. J. Thomson, F. R. S., revealed many shortcomings in the matter and manner of science teaching through all the stages of the educational ladder. Fortunately the committee have made very comprehensive and practical suggestions which should prove of great value not only in England but everywhere and the stage of education corresponding to our Middle Department has not been ignored in their recommendations.

I shall now proceed to consider some of the essential conditions which science teaching for the Middle stage should fulfil. In this connection the question of the choice of subjects to be included in the course as well as the manner of treating them must be kept in view.

(i) First of all science teaching at this stage should consist of science of daily life treated in an experimental and practical way in which the children will take a living interest. A course planned as if its sole object were to lay the foundation of specialised study in science in the High School and College course will not suit the purpose. It is only a limited number of pupils who will go in for such specialised study. The scheme of science for the Middle Classes should be a scheme of "Science-for-All" or "General Science" as it is now often called of which the key note is the pupils' own physical environment. It should enable the boys to understand the scientific principles which underlie the most familiar natural phenomena as well as important applications of science to the daily needs of pupils. Any scheme of such general science will also necessarily be of help in forming a foundation for a specialised study of science by the few who wish to go in for it, but that should not be our sole or chief aim and our course should

be drawn up to suit all and not limited to the special needs of a few.

(ii) When this principle is accepted it becomes evident that the scope of the topics included in the course cannot be restricted to any one "science subject" such as physics nor can even physics with chemistry alone suffice. The children's environments and interests are so extremely varied. They include not only inanimate objects and manifestations with which we mainly deal in physics and chemistry but animate objects as well. Some knowledge of plant and animal life including the human body itself is quite necessary. In this connection while condemning the narrowness of the scheme in England, Sir J. J. Thompson's Committee report says, "Physics and Chemistry must, we think, continue to be the fundamental subjects in the school curriculum, because every other science requires some knowledge of them but no boy should leave school with the idea that science consists of chemistry and physics alone." In India in particular a knowledge of important laws of health and hygiene is the most crying need of the time and an intelligent grasp of such laws necessarily requires some knowledge of the parts and organs of the human body with their functions, while a knowledge of plant life might with advantage be used in agriculture which after all is the premier industry of the country on which a vast majority of the population depends for their livelihood. Such a general science course appears to be gaining ground much more rapidly in America than in England and the best books available on the subject at present are mostly American but it should be remembered that the idea of "general science" is not a novel one even in England, because it is practically the same thing the teaching of which was advocated by Huxley under the name of Physiography.

(iii) Further, it goes without saying that all the topics included in the course should be within the comprehension and grasp of the young boys for whom it is intended and should be capable of being completed by assigning only a limited number of periods per week because as "Science-for-All" it has to be learnt by *all* and its study should not rob the other subjects of their legitimate share of time. The scheme though definite should not be rigid but should admit of adaptation and modification in the light of local interests and occupations.

(iv) Another very important point to bear in mind is the correlation of the science course with the other subjects of study. It will be readily conceded that different subjects should not stand aloof from each other but should as far as possible, be made to fit into one another so as to make a compact whole. But apart from this general consideration the connection of a science course with the teaching of geography on modern rational lines, based as it is on laws of physical geography, is so intimate that special care

should be taken to secure the correlation of the science course with geography. Fundamental facts of physical geography cannot be thoroughly realised without a knowledge of the physics of water and air and of heat and this physics should evidently be taught experimentally, as a science course. At the same time observation and record of natural phenomena forms a necessary part of both geography and general science.

The readers of the *Punjab Educational Journal* must have seen in the last month's issue of that Journal a splendid article on this very subject from the pen of such an eminent authority as Sir Richard Gregory, F. R. S. Dr. Whitehouse has rendered a public service by publishing that article and it is no longer necessary for me to dilate on this topic at any great length. I fear an attempt to pick out important sentences from that article will not succeed, because the whole article is important and needs to be studied as a whole, yet I cannot help giving a few extracts. Sir Richard begins by enumerating topics common to school science and geography, including observations of the sun and the pole star, phases of the moon, records of wind and weather, determination of maximum and minimum temperature, etc., and then goes on to say "there is often no correlation between the various stages of the school courses in science and geography." And again "it has been shown that almost all the topics of which an understanding is necessary to make the scientific side of geography intelligible are included in the school science courses normally followed. All that is wanted, therefore, is an adjustment of the order in which subjects are taught, on one hand in the science course, and on the other in the geography course." "What has to be avoided is duplication, and this can only be done by considering Nature Study, Science and Geography as a whole, so that each topic fits naturally into a particular section of the curriculum." According to Sir Richard not only should the science course be arranged to fit into geography but the geography course should also be modified to fit into a logical treatment of science. According to him, "Precise consideration of thermal influence on the earth should, therefore, be deferred in the geography course until after pupils have received instruction in heat in the science laboratory." But I had better confine myself here to science and leave the geography scheme alone.

Such sentences from his articles "It is agreed that up to that standard there should be no specialisation, and that all subjects in the curriculum should be taught as part of general education for all pupils," and "There is a reaction against this specialised instruction in the secondary schools and attempts are being made to construct a general science course of wider scope, one of these being the 'Science-for-all' syllabus of the Science Masters' Association," will go to confirm what has already been said above. It may be pointed out that Sir Richard himself quotes from Sir J. J. Thomson's Committee Report considering it an authority.

Correlation with other subjects such as hygiene and agriculture has already been hinted at, while the practical measurements and numerical examples bring science in direct touch with mathematics.

As regards the manner of treatment I would not reproduce here a series of lectures which might be given to the Training College Students on the subject but would like to mention a few points :—

(v) It is hardly necessary to say that in the teaching of science, practical and observational work by the boys themselves should form an integral part, but care will again be required in selecting the work assigned. After what has been said before it is evident that observation and record of natural phenomena should be given special prominence. The school might well possess a miniature observatory containing maximum and minimum and wet and dry bulb thermometers, a barometer, a rain gauge, and a wind vane for the purpose of meteorological observations. Also a horizontal platform with a vertical rod for determination of the north and south line and annual change of the sun's altitude. The Pole Star and the phases of the moon should also be observed. The dates of both the Hindu and Mohammeden sacred days and festivals are determined by the lunar month and therefore such observations will be of special interest though at present the ignorance of an average educated man on this subject is surprising.

Besides natural phenomena the pupils should also study and observe their other physical environments and for this purpose outings and visits should be arranged to places of interest which can be found in every locality. Even a country druggist's or a metal worker's shop may have much to teach. While visits to factories, water works, canal heads, etc., will be extremely interesting and instructive.

As regards the practical work in the class room itself the simple measurements and weighing and temperature reading, etc., will of course be done by each boy, but the problems should, as far as possible, be related with daily life. Measuring out medicine or marking doses on a medicine bottle, reading and noting the body temperatures are examples of such.

The boys might very well be encouraged to indulge in a little kindergarten work in the form of making models and toys which illustrate scientific principles. In chemistry practical work might include making and using soap and removing stains, cleaning glassware, etc., and in hygiene formation of healthy habits should be inculcated. Study of the life histories of flies and mosquitoes will prove interesting and instructive. Other practical work should consist of such simple experiments as can be performed by these young boys without expensive apparatus or elaborate

manipulation. Besides this, boys should also assist the teacher in the experiments demonstrated before the class. In short they should be given as much opportunity as possible of handling apparatus and doing individual work both in and out of the class room. It might be mentioned that it is conceivable that insistence on individual experiments might be carried too far. Such appears to have been the case in certain schools of England if we judge from Sir J. J. Thompson's report which says, "We are driven to the conclusion that in many schools more time is spent in laboratory work than the results obtained can justify." And again "Insistence on the view that experiments by the class must always be preferred to demonstration experiments leads to great waste of time and provides an inferior substitute. The time gained by some diminution in the number of experiments done, and especially by avoidance of unnecessary repetition of experiments of the same type could be well used in establishing in the pupils' minds a more real connection between their experiment and the general principles of the Science or the related facts of everyday life," but of course this does not apply to India where, if any thing, the individual work requires much more attention than is devoted at present.

A word might now be said about the apparatus and equipment necessary in a middle school.

The apparatus employed should be of the simplest type which will serve the purpose. Not only should inexpensive apparatus made by the pupils, though crude, be preferred to costly ready-made articles but even in the selection of such things as glassware, preference should be given to articles of familiar everyday type with a touch of the home about them if possible. Wherever practicable a tumbler and a cup might replace a cylinder and an evaporating basin. A cheap familiar wide-mouthed bottle fitted with a cork and two tubes is distinctly better than the strange two-necked bottle with its unpronounceable and unspellable name. A supply of ordinary things such as thread, needles, tacks, nails, cardboard, scissors, gum and glue are extremely useful though unfortunately they are seldom found.

One point for consideration is whether a laboratory fitted with big high tables, etc., is necessary for the middle classes. My view has always been that such a laboratory is not essential but in the schools provided with dual desks one of the class rooms should have desks with horizontal instead of sloping tops or what amounts to the same thin small narrow tables with chairs as you see in the Central Trainings College. In Delhi we are introducing small tables and chairs in the ordinary class rooms also as an experiment. The Science apparatus should be kept in that room and every class should come there in the science periods. Much of the observational work by the boys will be done out of doors. The experiments assigned to the ~~g~~ in ~~g~~ e class room will

be of the simplest kind and horizontal topped dual desks or small tables will serve the purpose all right. The expenditure on a laboratory reserved exclusively for this purpose will be absolutely prohibitive.

Having discussed some of the principles, which should govern the choice of subjects and the method of dealing with them, I must come to consider in the concrete the scheme of science work prescribed for the Middle Classes. In this connection I must confess that I am rather at a disadvantage because, as you know the scheme was drawn up by me ; and, although I had the benefit of the advice and approval of authorities on education and science, such as Professors Wyatt, Parkinson, Hemmy, Wilsdon and last though by no means least of Prof. Arthur Smithells, F.R.S. of the University of Leeds, who came as special lecturer to the Punjab University in 1913-14, I may find it difficult to shake off the natural partiality of an author towards his own production. I might be permitted to say however that judging from the criteria laid down above our present scheme appears to fulfil the requirements. It is matter for some satisfaction that, although it was drawn up in 1915, it generally accords with the principles laid down by the Thompson Committee in 1918.

Relation with natural phenomena and daily life is the key note of the whole scheme and correlation with geography is so intimate that it is generally spoken of as the scheme of practical geography and for the purpose of examinations, etc., science and geography are treated as one subject. The scheme is elastic and adaptable to local needs and yet the treatment is so systematic and logical that it supplies all the knowledge of the physics of water and air and of mechanics and heat which is given in ordinary books of physics. It also provides elementary knowledge of chemistry treated from a domestic and sanitary point of view. The animate side, *i.e.*, plant and animal life is not ignored and inclusion of lessons on fermentation, bacteria, disinfection, plant, food, etc., renders it directly applicable to hygiene and agriculture. Emphasis is laid on formation of healthy habits. As to how far the scheme is actually fulfilling its function, is more than I can say. The teacher's own interest and enthusiasm is the most important factor in the success of a study like this. All that can be said is that a teacher endowed with these qualities will find plenty of scope for exercising them.

THE TEACHING OF AGRICULTURE IN SCHOOLS.

BY LALA LACHMAN DAS VERMA, M.A.,

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Introduction. In an agricultural province like ours, where about 60% of the population consists of actual producers of wealth from the soil, and of their direct or indirect dependents, no educational scheme can claim thoroughness or popularity which does not provide for some sort of agricultural training for the rural lads.

This seems to have been realised by the Department of Public Instruction, Punjab, soon after its inauguration, as old records show that agriculture in some form or other did find a place in the curricula of all grades of schools, including training institutions.

Educational system criticized. Unfortunately however no systematic efforts were made to develop this branch of education by supplying agriculturally trained teachers and suitable equipment for practical instruction in the subject. The result was the disproportionate development of the literary and virtual suppression of the practical side of education. It is a matter of common knowledge now that this state of affairs has not proved conducive to the welfare of the country. Education instead of promoting the premier industry of the province, as it has done in all progressive countries of the world, has, on the other hand, helped in giving it a set back by weaning from the land the intelligentia of the country-side. No wonder then that people became dissatisfied with our system of education. It was said and with much truth, that by giving too much 'bookish' instruction, the rural boy was being unfitted for his natural future on the land and encouraged to seek for clerical employment in towns to the detriment of our population as a whole.

Government of India's action. With a view to introduce the desired reform, the Government of India in 1917, on the recommendation of the conference on agricultural education held at Simla, decided to develop a method of direct tuition in agriculture to agriculturists of school-going age. It was resolved by the conference that it should be laid down as a goal, that every rural district should have one or more agricultural middle schools.

The conference further desired to emphasise the importance of practical work in any school professing to teach agriculture, by having a plot of land attached to it. To give effect to these recommendations the Government of India sanctioned a sum of Rs. 30 lakhs for the financial year 1918-19 for expenditure on technical and agricultural education, of which not less than Rs. 25 lakhs were earmarked for agricultural education alone.

The Punjab Government discussed the Simla conference resolution in two provincial conferences and accepted the following main conclusions :—

1. No attempt should be made to teach technical agriculture or horticulture in Primary schools.

2. Nature study should form an essential part of the teaching in Primary schools.

3. The text-books in use in Primary schools should be adapted to the environments of the pupils.

4. All attempts to teach practical Agriculture in Normal schools, no use of which is made by the students on their subsequent employment in primary schools, should be definitely abandoned, and a detailed course of nature study should be substituted in its place.

5. Technical agricultural middle schools as proposed by the Simla conference being not desirable in the Punjab, the existing Vernacular middle schools should be utilised as vehicles for the spread of agricultural education in rural tracts. In order that practical processes of agriculture could form a necessary part of the course, such schools should be provided with trained teachers, a plot of land at least 3 acres in area, bullocks, implements and other necessary equipment.

6. Selected Senior Vernacular certificated teachers to receive necessary training in agriculture at the Punjab Agricultural College, Lyallpur.

7. For Anglo-Vernacular Secondary High Schools arrangements for the teaching of practical agriculture should be made only in places where there are two or more high schools having agricultural classes; the students of different high schools attending their own schools for tuition in all subjects other than agriculture, but in this subject they should receive tuition at a centre common to them all. The teacher, a plot of land, at least five acres in area, bullocks, implements and other requirements of the centre to be provided at the expense of the Government.

With a view to give practical shape to these decisions, the first step taken by the Department of Education was to start in July 1918, at the Lyallpur Agricultural College, a class for selected Senior Vernacular trained teachers. This class has continued since, and so far 154 teachers have received training

Punjab
Education
Department's
action.

In February 1919, Mr. Richey, the then Director of Public Instruction, Punjab, outlined the entire scheme of Agricultural Education in Schools in his Circular No. 77. The provision of this circular formed the basis of all agricultural work done in schools up to 1923, both in Vernacular Middle Schools and Anglo-Vernacular High Schools.

A syllabus of the courses in Agriculture for the four Middle Classes of Vernacular Middle Schools was adopted and subsequently three new agricultural primers were prepared under the auspices of the Punjab Text-Book Committee. A fourth primer is still under preparation.

As to equipment for instruction in the practical processes of agriculture, each Vernacular Middle School was required to have :—

- (a) A plot of cultivated land, near the school, at least 3 acres in area.
- (b) A pair or two of bullocks.
- (c) A set of implements and tools, indigenous and improved.
- (d) A building suitable to accommodate bullocks, implements, stores and the farm chaukidar.

Government undertook to pay a grant of Rs. 3,500 per school for initial expenditure. It was understood that the recurring expenses, on the farm as well as the teachers' agricultural allowance would be paid by the local bodies controlling these schools.

Soon after the introduction of the scheme the Province had to face a severe financial depression and in consequence most of the District Boards found the responsibility of paying allowances to Agricultural Teachers, and that of meeting the annual deficit on school farms, too heavy for their resources and they lost no time in giving vent to their feelings against this expensive type of agricultural education. Several other difficulties also were experienced, the most serious being in regard to purchasing land for the sanctioned estimates of Rs. 250 per acre, and concerning the provision of suitable facilities for securing irrigation water.

In spite of these difficulties, the progress during the first four years was fairly satisfactory, though slow. By the end of the year 1922-23, 44 Vernacular Middle Schools were teaching Agriculture under the supervision of trained agricultural teachers.

A new Circular announces important changes. In September 1923, the Department announced some important changes in policy to meet the situation caused by financial depression. A fresh circular was issued, the main provisions of which were :—

- (a) The initial expenditure required to start 3-acre farms being large, their number should be limited.
- (b) Government would contribute towards the loss on the working of an efficiently managed farm, up to a maximum of Rs. 100 per annum, for a period of five years from the date of starting each farm.
- (c) The starting of small school gardens (up to a maximum of $\frac{1}{2}$ acre in area) should be encouraged.
- (d) Government would contribute towards initial expenditure on the garden plots, up to a maximum of Rs. 300 per plot and towards the net deficit on the working of a plot up to a maximum of Rs. 30 per annum for a period of five years from the date of commencing work.
- (e) Government is prepared to meet the allowance of Rs. 10 per mensem for each approved agricultural teacher, whether managing a farm or a school garden.
- (f) The present teaching of Agriculture might be expanded into a new subject of Rural Science which would include the existing course in agriculture (theoretical as well as practical), would substitute agriculture for pure Science, and would embrace subjects such as Elementary Civics, Hygiene, Sanitation, Physical Geography and principles of Co-operation.

The present position. This circular had the desired effect and agriculture in Vernacular Middle Schools began to prosper. By the close of the School year 1923-24, the number of schools teaching agriculture rose from 44 to 60.

At present 80 Middle Schools are providing agricultural education and for the current financial year the opening of 20 new farm and 10 garden plots has been sanctioned by Government. It is hoped that by the end of March 1927 the number of Middle Schools teaching agriculture will be close on 110.

Farms or Garden plots. To meet the wishes of District Board and other critics of the scheme, honest efforts have of late been made to make school farms as nearly self-supporting as possible and a considerable measure of success has been achieved in this direction. But it must be confessed that the task is by no means easy, as a three-acre farm is not an economic holding. Moreover, it has

been observed that such efforts have in almost all cases involved a partial sacrifice of some of the educational aims.

The vocational value of school farms is undoubtedly great, as these institutions are most fitted to bring home to the sons of agriculturists the advantages of applying scientific principles to the practical processes of agriculture, and to disillusion them of the belief current among our zemindars that in agriculture there is nothing new to learn.

The scope of school farms to serve the purpose of demonstration to local and neighbouring zemindars is necessarily limited, and much cannot be expected of them in this line. Moreover this function was never intended or designed for them. But it is gratifying to find that incidentally some of the more successful school farms are already serving as excellent little demonstration farms for the benefit of the local zemindars also. It has now been established therefore that school farms, if well managed and provided with suitable facilities, can be of great educational value not only to the school children, but also to the cultivators in the neighbourhood.

The garden plots attached to Vernacular Middle Schools since 1923, are practically inexpensive institutions, many of them being already self-supporting, and some actually paying. They cannot however provide those facilities for learning the vocational side of agriculture that a well-equipped school farm unquestionably provides. To tide over the financial crisis however, the starting of these had become a matter of necessity. Unfortunately they have not yet appealed to the zemindars who look more to the practical than to the scientific or academic side of agricultural education. To them the school farm appears a much better institution, as there they can see agricultural work actually in progress, showing results that they can understand and appreciate.

The continuance of the scheme for garden plots side by side with that for larger farms is however indispensable, because the provision of a regular farm with each Vernacular Middle School, attempting to teach agriculture, is not practicable owing to local or geographical difficulties.

The Punjab Scheme. In the foregoing paragraphs an effort has been made to describe briefly the history and scope of the scheme of agricultural education as followed in our Vernacular Middle Schools. The success that this scheme has attained, has been so conspicuous as compared with that achieved by the scheme of Agricultural Middle Schools originally suggested by the Government of India that the Board of Agriculture has recommended its adoption in other provinces. In fact many of the provinces have already decided to discontinue their original projects and to take up the Punjab system.

This, however, should not lead us to the belief that the Punjab system is perfect. In actual practice several points have cropped up that require immediate attention as they may in time tend to lower the efficiency of the scheme.

Some observations.

Some of these points are :—

(a) Agriculture is only an optional subject, being one out of five or six prescribed for Vernacular Middle Schools, and what is worse, usually three or four and even five of these optional subjects are taught in the same school. The time that can be devoted to agriculture is therefore necessarily limited.

In schools where English is introduced as one of the optional subjects, agriculture generally suffers, as in this case the prescribed periods of study are reduced from 6 to 2 in the upper middle and from 4 to 3 in the lower middle classes. As optional English is the most popular subject, being generally in demand, the other optional subjects, particularly agriculture deserve to be protected, if Vernacular Middle Schools are intended to retain their vernacular and rural character.

(b) The syllabus in these schools is heavily language ridden, more than half the available time being taken by languages. Literary influences thus preponderate, and a subject like agriculture will not succeed unless the Head Masters and Inspecting Officers show marked partiality towards it, particularly in the initial stages of progress.

(c) There is complete absence of any incentive for boys to put their hearts into the work, either on farms or garden plots. They are not permitted to touch the farm produce which they raise.

(d) Often less is thought of the educational value of the subject to the children than of what the skilled farmer would say if he finds in the farm or the garden a row not quite straight, a crop growing not quite as well as it should, a few weeds growing rather luxuriantly in a plot, or a boy holding a tool wrongly, or some other such details. It is usually forgotten that in farming as in other school subjects much is learnt by mistakes. If a boy is allowed to make mistakes and to discover them independently, he has a surer chance of learning the correct ways of doing things than a boy who is studiously prevented by the teacher from making mistakes.

The result is that in their eagerness to present a farm or a garden in its best form, the teachers are apt to ignore the fact that this institution is essentially for boys and not for their teachers. The work on the farm or the garden is calculated to produce a certain attitude of mind towards agriculture in particular

and towards all rural pursuits in general. If a farm or a garden fails to achieve this, it is educationally a failure, although it may be growing excellent crops and may be a great financial success.

The introduction of the commercial spirit and the destructive criticism of the inspecting officers are largely responsible for this regrettable state of affairs.

(e) The longer an agricultural teacher is engaged in actual farming on the school farm, the more valuable and indispensable he becomes. It has however been noticed that just when an agricultural teacher has begun to be indispensable, he is shifted to become the headmaster of another middle school—generally a non-agricultural post. The experience of the man is thus lost to the agricultural section of school work. The continuance of the practice will prove detrimental to the interests of agriculture in schools.

(f) The fact that a uniform rate of agricultural allowance, *viz.*, Rs. 10 per month has been sanctioned for trained agricultural teachers whether in charge of school farms or garden plots, has given rise to much dissatisfaction among the farmer. The management of a farm undoubtedly entails much heavier responsibility and work than the management of a small garden plot, therefore it is but fair that some distinction should be made in this allowance.

With the exception of two or three schools, where the introduction of agriculture has been permitted as a special case, agriculture is not as a rule taught in Anglo-Vernacular Middle Schools.

Agriculture
in Anglo-
Vernacular
Schools.

Four High School Centres of Agriculture were however started in 1919-20 in pursuance of Mr. Richey's scheme. As they are all situated in large towns, the initial expenditure incurred was very heavy. They have besides proved of doubtful value in so far as the accomplishment of the ultimate aim is concerned. The syllabus of the course of instruction in agriculture for high classes is controlled by the University, without whose approval no improvement in it can be effected. Again it has been noticed that the majority of the students taking up agriculture for their Matriculation Examination, do so, not because they have any genuine interest in the subject, but mainly because they regard it as a soft subject.

For these reasons the Government has decided not to start any more such centres. Sir George Anderson is however anxious to provide funds for the introduction of agriculture in the secondary departments of such Government High Schools as are situated in typically rural surroundings and have a high percentage of

agriculturists on roll. In such schools even it is his desire that agriculture should not be treated as an examination subject, but merely as a hobby—the properly equipped farm to be provided there being regarded as a means of suitable training and profitable recreation. A beginning has already been made at Renala Khurd, in Montgomery District, and negotiations are in progress to start the experiment at a few other suitable places also. It is hoped that this new experiment will meet with better success in arousing a genuine interest in agriculture, and like games, drill and Scouting the subject will win popularity among the sons of agriculturists.

From what has been said above it will be clear that while providing for instruction in practical agriculture, Government has, to start with, selected the rural vernacular Middle School for work of an intensive nature. The school farms originally intended for rural children, seem destined to play even a much more important rôle. They give hopes of serving as a means to an end ; namely, to unite school and community life. As time rolls on, the rural school, in its evolutionary progress, is bound to embrace the farmers' fields and his home. In their widening responsibilities therefore school farms need sympathy and not adverse criticism ; constructive optimism and not destructive pessimism.

THE INFLUENCE OF ELEMENTARY SCIENCE TEACHING ON THE DEVELOPMENT OF AN ORDERLY MIND.

By B. H. WILSDON, M.A., B. Sc.

The best I can do in the time available is to place what ideas I have before you in such a way that those of my hearers more acquainted with the practical difficulties of school teaching in India than I am, may be induced to project the ideal upon the hard plane of the actual—if only in discussion.

I am not the man to want to read a homily on the virtues of science. The educationists and no less than his brother, the teacher of science, is peculiarly liable to become a ' prig ', by which I mean one who is much too conscious of his own virtues and excellencies.

The scientific prig is, of all types the most aggravating, particularly to the philosopher who makes all knowledge his province. As there may be philosophers present I must therefore be chary of vaunting the virtues of science too blatantly. But this attitude, which is usually written down as pedantic priggishness, may be no more than a garment worn perforce as a professional uniform. It may be steel armour, proof against the shafts of pupils and the unenlightened public, but the wearer may be only too conscious of the soft tissues beneath the shell.

I therefore asked myself when presented with this subject as a contribution to the Science Section of the Punjab Educational Conference if I possessed an orderly mind. Was mine not really rather disorderly? And after all did I not rather prefer that it should be so? That second conscience, my wife, learning of the subject on which I was engaged in writing, showed she had no doubts whatever. "You of all people!" was her actual remark. Such a shaft effectually penetrates the shell of self-complacency, so instead of dilating on the peculiar benefits I have noted in myself and others, attributable to a knowledge of the fundamentals of science, I mean to examine first the type of orderliness I should really like my mind to possess and then see to what extent our elementary science teaching is likely to inculcate a similar attitude on the youthful.

The very first characteristic I should like to see developed would be the instant, automatic doubting of all information not verifiable. Such an attitude may seem to approach Bolshevism rather than orderliness. But one may be quite polite in reserving acceptance of unsupported statements. Bolshevism more frequently seems to proceed from a refusal to listen to *any* statement, or at any rate a certain refusal to examine the subject. For if one examines a subject one must look at it from all points of view and I cannot help feeling that the typical Bolshevik gives scant attention to the point of view of anyone but himself. So what may appear to be a very questionable virtue in such extreme forms as are exhibited in politics, may be no more than caution, or 'scientific doubt,' in the normal individual. This doubting, scientific, religious, or political, is of course a purely negative characteristic and must be supported by something more positive. This I think inevitably follows, provided the doubt exists. As Nature abhors a vacuum so the mind detests the unexplained. Even the most primitive savage has an 'explanation' for the most fundamental phenomena of Nature. All mythology is an example of this. We may learn in such a book as Fraser's 'Golden Bough' the early history of man's attempt to reduce Nature to the order an orderly mind requires. We may now say with profound satisfaction that a stone falls to the ground on account of the law of gravitation, or we may even follow Einstein and regard it as a consequence of the geometry of space and time. The difference between the man who accepts Einstein's universe and the savage, lies only in the process by which the attitude is assumed. The man who accepts the Einstein theory as the result of reading a journalist's popular 'write-up' in the newspaper, is little better than the savage. In fact, some people's minds are so orderly that they are only too glad to believe that the law of gravitation has been satisfactorily explained at last by someone with a German name and regard that particular wilderness of Nature as reduced to law and order. They may then travel comfortably across the frontiers of knowledge by taking a ticket in their favourite

charabanc line, enjoying the scenery at the megaphonic dictates of their journalist guide in congenial company.

But while an orderly mind with "everything in its place and a place for everything" may be a comfort to its possessor, it may be a positive aggravation to others with whom it comes in contact, and the general intelligence which arranges its furniture much below that of the savage. The orderliness we want is not that of the draper who knows where his goods are to be found.

The draper may have to learn a most extensive vocabulary to describe all the materials in his stock. His book-keeping and stock-book may be models of orderliness, but we should scarcely call his mind scientific on that account. Samuel Butler's gibe at the scientific reputations of his day is warranted if this is all we mean by the orderly mind of science. My conception is however somewhat different. I make no complaints at the untidiness of a workshop with raw material and discarded scrap lying about all over the place, so long as the essential tools and machines are in good order and well kept.

The average intelligent child who asks why the moon stops up in the sky, or any other similar conundrum, is not satisfied by mere words. The simplest plan when faced with such questions is to say, "It is too difficult to explain now but you will understand it all some day when you are grown up." But while silencing the enquirer, it certainly will not satisfy him. It is much better to show that an explanation can be found if we look for it. A stone and a bit of string will serve to satisfy him that some 'thing' like the tension of the string must be holding the moon in place. You may call it the attraction of the earth if you like, but the child will now have a model in his mind. The fact will not be relegated to the cobwebby cellar, merely labelled but untasted. The model will be set going to explain other facts the child meets. The great thing is that he will realise that our explanation is only a *model* and not something transcendental in the way of absolute truth supplied at so much a yard from the drapery store. I feel that too many of our teachers are retail shopkeepers instead of artisans. Order is a good thing, but we do not want to reduce our science teaching to a mere giving of names suitable for a ready reference filing scheme.

Now it is true that some of the material of science is so vast that the greatest authority has not yet emerged from the stage of labelling and docketing. Botany and Zoology are still largely in this condition. They are therefore in my opinion very unsuitable subjects for early instruction in science. They may inculcate habits and observation, but little else. When you have finished counting the number of petals or hairs or arms or legs, and even remembered all the other similar enumerations

you have made, what constructive exercise of the mind remains ? This seems to me to be the inherent weakness of such a school subject as 'nature study.' You teach observation (at dictation) without any synthesis.

The child must proceed quite early beyond the stage of nomenclature and classification : he must be given something to do and not merely something to say. Science, it has been said, commences with measurement. The evolution of science from the fairy tales of mythology to the mathematics of the modern physicist must be recapitulated in the pupil, just as is our ancestry in the embryo.

It is only the physical sciences which afford a practicable means of introducing the discipline of measurement to the elementary school boy. The sentimentalist may shrug his shoulders at a curriculum which introduces the fresh mind of youth with all its trailing glories, to the beauties and complexities of Nature by means of a foot rule. He may say "Cannot we inculcate a love of Nature in the child while leaving the drudgery of measurement to the later stages of specialism ?" I should say 'Decidedly No.' A love of Nature, however keen, cannot provide the same training as the discipline of the Physical Sciences. It is *discipline* we want. There seems no reason for believing that it is from the keen nature lovers that we shall recruit the more disciplined and orderly minds. The mere naming of birds' eggs or butterflies or flowers does not teach the precise use of words which describe the abstract. It does not lead to the testing of statements by the touchstone of experiment and measurement. The habit of precise definition and logical analysis in terms of defined and dimensioned quantities is what must be looked for in the orderly mind. That is why I consider mechanics and physics an absolutely essential part of the education of the modern schoolboy.

It has been said that to most questions there are three possible answers : "Yes," "No" and "I don't know." Science should teach us to give a fourth "Let's find out".

It is this new attitude which has made modern progress possible. Not the attitude in the minds of the inventors and scientific pioneers alone, but the determination to "find out" in the general mind. The unspecialised mind may be incapable of doing the 'finding out' for itself. It may be necessary to delegate these functions and endow other minds. A mind disciplined in the fundamentals of science will trust intelligently the discoveries of the specialised research worker—the expert. This is a different type of orderliness of mind from that which will swallow any fairy tale of science unquestioned. It is the discipline of the workshop and not of the drapery store. It is to be hoped that one of these days we may trust our expert politicians or economists in the same way we trust a surgeon who operates on

our bodies. This day is not likely to dawn however till economics and politics become sciences and the generality of the public learn to appreciate them as such.

Throughout I have intentionally refrained from saying a word about the utilitarian value of science. I have regarded it only from its intellectual value. One cannot teach applied science to school children. They must have the science first. A course of hygiene, for instance, can only be of *intellectual* value in so far as it applies scientific principles. The scientific principles which can be used by school children in building up the science of hygiene are so limited that I feel much of the instruction would be better conveyed under the authority of religion. It is better to teach 'Cleanliness is next to Godliness' than to teach as a science things for which you have no scientific explanation. I do not wish to dispute the possible utilitarian value of hygiene, but the orderliness of mind produced by such exercise of authority is not the order desired and to be expected from Science teaching.

Some of the points I have made in this address are deliberately provocative. I hope there will be someone stirred to reply. My main object is to point out that while good science teaching can do nothing but good, bad teaching may be excessively bad. We may produce slow minds, drugged and sleepy. Let us all consider how far our science teaching will stand the test of an intellectual training rather than the droning of a preacher.

NEW MOVEMENTS IN THE TEACHING OF GEOGRAPHY.

BY L. SOHAN LAL, B. A., B. T.,

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During the Great War and after, it was realized in a greater degree than before that education in schools and colleges should be made more practical than it had hitherto been. It should be a vitalising force and should enable the child to earn a living and should also enable him to be a good citizen. His education should prepare him to perform his duties towards himself and towards others. In the overcrowded curriculum of our schools there is no room for subjects which do not conduce to these results. Geography is a subject which, if properly taught, is eminently fitted to conduce to the realisation of this ideal of education.

Our outlook on life is now changed and hence the conception of geography is not exactly the same as it was before the Great War. If we examine the question papers of the various Universities of India before the Great War and also examine the contents of the text-books of that time, we find that much

stress is laid on explanation of facts and on such things as astronomical and meteorological phenomena. That kind of geography was styled Scientific Geography. The life of the people in various regions and their bearing on our life was not properly emphasised. One of the common questions asked at the Matriculation examinations was " Explain the causes of Tides ". All experienced teachers know that the causes of tides can never be correctly understood by our students unless they have a fair knowledge of Mathematics. The most important thing about tides to which attention is now paid and should be paid is the effect of tides on the navigation of ships, on establishment of ports, and consequently on trade and commerce.

No doubt performance of scientific experiments is necessary for the teaching of the geography of air and water, but the teaching should not be confined to these facts only. In fact what was called Scientific Geography is in the words of Professor Gregory ' most unscientific ' for it left out of account the work of man. The function of geography is to show how people live in different regions and how their life is adapted to their surroundings and how far they have adapted their surroundings to their best advantage. It also shows in a greater degree than any other subject the dependence of man on his fellow-beings and thus his duties towards others. For our daily bread, clothing, housing, transport, even for literature, religion, in fact for everything which we love and which makes this world worth living in, we are dependent on thousands of men who work day and night, in sun and rain, in deep mines and heights of mountains; should we not be grateful to these men? Should we not do something to help these men? The function of geography is to train future citizens to imagine accurately the conditions of the great world stage and so help them to think sanely about political and social problems in the world around; in other words, geography should be taught in such a way as to enable the pupils to understand their duties to themselves and to others, and the geography teacher should be an important factor in the service of the community in which he lives.

In the Punjab the most important industry is agriculture and during the last 5 years a large number of high schools have been established in rural areas, hence the teaching of geography should be given an agricultural bias to suit the environment in which the school is situated. By the end of their school course the pupils should know :—

- (1) the chief crops and occupations of their own neighbourhood with their distribution and markets,
- (2) the main productions of the world, their localities, markets and transport,
- (3) similar information about India in rather more detail,

(4) the climatic and other conditions under which men have to work in the world.

In addition to this the pupils should also be led to find out various methods of agriculture in different parts of the world and compare and contrast them with those followed in their own province.

In teaching the geography of China the teacher should tell how the farmer rises early in the morning when it is still dark and carefully removes all insects and weeds from his fields and uses all kinds of manures in growing his crops. In teaching the geography of Japan he should bring out how every little patch of the available ground is cultivated most diligently and how, both in China and Japan, every substance convertible into manure is carefully husbanded and used. During the summer months all kinds of manures from vegetable refuse are mixed with turf, straw, peat, weed and earth collected into heaps and when dry set on fire after several days of slow combustion the entire mass is converted into a kind of black earth employed for the manuring of seedlings. Oil cakes, horn, hair and bones are highly valued and so is soot. Dung of all animals but more especially night-soil is esteemed above all other manures. It is for this reason that though fields of these countries have been cultivated for thousands of years, yet there is no sign of soil exhaustion. There is no reason, apart from prejudice, why the methods of utilizing nightsoil adopted by the Chinese and Japanese should not be followed in India.

While teaching the geography of Denmark special emphasis may be laid on cattle breeding and dairy farming and co-operative societies. It should be shown how 150 years ago Denmark was one of the poorest countries in Europe, but now it is one of the richest countries. It has a poor soil, swamps and barren areas ; but by growing fodder crops which suit the soil and by paying attention to scientific breeding the Danes keep far more cattle in a small area than any other country and their cows produce much more milk than ours. In Denmark people do not keep weak and useless cattle. They cannot allow their meagre resources of fodder and grain to be used by useless cattle, but in the Punjab there are large herds of quite useless cattle eating up pastures and roaming wild to spread disease and infection.

Denmark excels in the dairy farming industry owing largely to the successful way in which her co-operative societies have been organised. There are co-operative dairies co-operative farms and co-operative sale societies and the result is that Danish butter is of world-wide renown. We in the Punjab can also achieve the same results if we follow scientific methods. In the Punjab at the Hissar Government Cattle Farm, by scientific breeding, cows now give as much milk as 15 to 20 seers a day and the butter and cheese produced at the Government Dairies at Bangalore and

Karnal are not in any way inferior to those of Denmark. The only thing required is the diffusion of scientific knowledge among our agriculturists. The geography teacher can at least arouse the interest of the agriculturists by telling them of the results obtained by scientific dairying and agriculture in other lands and in his own country.

In teaching the geography of Switzerland the importance of forest to the agriculturists in leading them to carry on a large number of subsidiary industries such as resin tapping, toy making, and the development of water power and its application to industries should be clearly brought out. In teaching the geography of the United States dry farming in the Western plains and the methods of irrigation in the Punjab and the Deccan should be compared with it, and it should be shown that the study of physical properties of soil has received special attention and the system of dry farming is nothing more than the scientific treatment of soil. The method consists in so manipulating the soil as to conserve the little moisture that is available, by deep and constant cultivation of the soil. In this way arid lands of western United States which were once considered unprofitable have been brought under cultivation and important crops are produced. We in the Punjab have similar tracts in the Thal, in Mianwali and Muzaffargarh, districts where rainfall is very scanty and canal irrigation has not yet been extended and very little farming is done there. Why cannot we apply the same methods to these areas ?

Geography teachers should also pay special attention to everyday occurrences such as the electrification of the G. I. P. railway, the opening of the Sulemanki Head Works of the Sutlej Valley Canals, the passing of the Chos Act in the local Legislative Council for the afforestation of the Siwalik Hills, the construction of a harbour at Vizagapatam, the erection of a power house at Dhariwal, the construction of the Kangra Valley Railway, the Mandi-Hydro-Electric scheme and many others. It is these things which bring home to the pupils that geography is of living interest.

If possible the magic lantern should be used in giving such lessons. For your information I may mention here that the Punjab Education Department is preparing sets of slides on such subjects as the Punjab Forests, Irrigation in the Punjab, the Mandi Hydro-Electric Scheme, Village Sanitation, Water Supply, Improved Methods of Agriculture, etc. They will be available for use in all districts. Some teachers may express doubt as regards the utility of the passing of the Chos Act to Geography students. I say it is of the utmost importance. Here is an occasion for the geography teacher to show his pupils the importance of the preservation of forests. By allowing the forests of the Siwalik Hills, in the Hoshiarpur and the Ambala districts to be recklessly destroyed by men and grazing of sheep and goats

the mountain torrents called chos have brought thousands of tons of infertile sand and boulder and spread it on agricultural land thus rendering it quite useless. Now the condition of the agriculturists of this tract has become most pitiable. The Government is now planting trees on the Siwalik Hills so that these mountain torrents may be controlled and barren hills may become great stores of fuel, fodder and timber.

As I am reading this paper, the opening ceremony of the Shahdara-Narowal Railway is being performed by His Excellency the Governor of the Punjab at Shahdara. This is a fit occasion to say something about this railway. It is about 49 miles long and connects Narowal and Shahdara on the bank of the river Ravi through a region which has good cultivation. The linking up of Narowal with Shahdara opens up an area brought under irrigation in recent years and gives easier communications with Sheikhupura, the headquarters of the District which the greater portion of the line traverses. Apart from local traffic from the immediate area traversed, the construction of the line removes at once the disadvantages under which the Sialkot-Narowal line labours. Direct communication between Sialkot and Lahore is obtained and the traffic is able to follow its natural trend. The Sikh population forms a large area to the west of the River Ravi and is enabled to travel to Nankana Sahib, Dera Baba Nanak and Kartarpur Sahib, important places of Sikh pilgrimage. Another result of the opening of this line will be that important markets will grow up all along this line, the villages which were unimportant will now become important markets.

Method of Inquiry.—I have told you a few facts about the Shahdara-Narowal Railway. This is a mere narration. But our method should be the method of enquiry. The same facts can be educed from the students themselves by making them study various maps and giving them points of enquiry such as the following :—

Find out from the irrigation map of the Punjab whether the area through which the line passes is irrigated. What are the crops grown in this area ? Through which district does the line mainly pass ? Does it give access to the headquarters of this district ? What is the main religion of the population of the areas through which this line passes ? Are there any Sikh shrines to which this line will give access ? Which important town is directly connected with Lahore by means of this line ? Which villages are likely to become important markets ? Why ?

This method of inquiry is far superior to mere narration. The essential features of the method are that the pupils should be able :—

- (1) to observe accurately,
- (2) to record observation in books or maps.

- (3) to interpret maps both orographical and statistical,
- (4) to use and interpret statistics,
- (5) to draw and interpret graphs,
- (6) to select facts from books.

Now one word about the regional method of teaching geography. In my visits to local schools, whenever I put any question as regards the climate of products or occupation of the people of any individual country, I get this reply from the teacher "Sir, we teach regional geography, the students are not expected to answer the questions about separate countries in Africa, or Europe. You may ask questions about the Equatorial Region, or the Mediterranean Region or any other region." In fact the true meaning of Regional Geography is not understood. It is not a branch of geography, but a method of teaching geography according to which, for the purposes of study, the world or a continent is divided into a number of geographical units on the basis of surface, climate, products and activities of the people. The teaching should not stop here. Major natural regions must be subdivided into political units, that is, the pupil should find out what countries or parts of countries are included in each region, and how the differences of mineral products and standards of civilization have brought about differences in human activities of these countries forming a part of the same region. We cannot disregard these political divisions. In newspapers, magazines and in our commercial relations we speak of political countries, not of natural regions. There is also a tendency to omit all names in teaching geography. This is also to be avoided. No doubt our maps and text-books should not be overcrowded with a large number of unnecessary names, names of places are extremely necessary, for we have commercial relations with all parts of the world, but these names should not be taught isolated in the forms of lists, they should be taught in connection with the study of regions and should be associated with interesting facts.

Regional Survey.—Connected with the method of enquiry is the necessity of Regional Survey, by the pupils of a small area of their home district. By Regional Survey we mean a survey of a district as an environment for human beings—an account of its physical features, its natural characteristics, its flora, fauna, minerals, etc., culminating in a study of the manner in which they affect human life and activity. It is extremely necessary that the students in upper middle and high classes should make detailed observations of their surroundings, classify these observations and be able to draw correct inferences from them. It is this first-hand knowledge which will enable them to understand the geography of other regions. These surveys will enable them to understand the physical and economical aspects and their influence on corporate life of the community. The following are the points

of enquiry which are suggested for these detailed surveys :—

1. Name your village, tehsil and district.

2. Find out (a) the position of your village with reference to Lahore. State also its distance from Lahore.

(b) Its latitude. Find out by observing the altitude of the midday sun on 21st March, 23rd September, 22nd December or 21st June.

3. *Surface features.* (a) Which parts are high ? Which low ? (b) In which direction is the slope ? Verify your observations from the survey map of the village.

(c) If there is a river or a stream near your village, state its position with reference to your village. Where does it rise ? Where does it end ? Does it flow throughout the year ? When is it in flood ? Why ? Is it used for irrigation or for any industrial purposes ? Is it used for navigation, if so what goods are carried on it ? To what other uses can it be put ?

4. *Climate.*—Consult records.—Make observations of temperature, rainfall, wind direction, atmospheric pressure and humidity and find out the average temperature of June, July, December and January, average annual and seasonal rainfall and the direction of the prevailing winds in summer and winter. Which winds bring rain and what is the effect of winds and rain on crops ? Mention if there is any special peculiarity of the climate of your village. In which month is frost seen ? How can you protect your crops from this frost ?

5. *Soil.*—What kinds of soil are found in your village ? What is their peculiarity ? What are the chief ingredients of these soils ?

6. *Vegetation.*—Which parts of your district are forests, pastures, wastes and cultivated lands ? Show in a map. Name the chief crops. Write against each (a) time of its sowing, (b) time of its harvesting, (c) kind of soil in which it is grown. Is artificial irrigation employed, if so by what means ? Are manures used ? If so, what are the manures used and from where are they obtained ? Is rotation of crops adopted ? If so, name the crops used for rotation. What is the yield per acre of each crop ? How does the yield compare with other districts ? How are crops brought from the fields to the local markets and from the local markets to the ports of export ? Can you give any suggestions for improving the crops ? What are the chief trees found in your village ? What are their main characteristics ? To what uses are they put ? Make a list of the fruit trees grown in your village.

Animals and mineral products.—What are the domestic animals found in your village ? How are they helpful to the

villagers ? How much milk does your average village cow give ? How much wool is obtained from your village sheep ? Can you give any suggestion to improve their breed ? What are the diseases which your cattle and sheep are subject to ? Is there any mineral obtained in your village ? How is it obtained ? What are its uses ? Is it used in the village itself or sent anywhere else ? Where is it sent ?

Mills and Factories :—If there is a mill in your village, find out the following points about it :—

(a) What is the power used ? (animal, steam power, water power, electric power, oil engine, etc.)

(b) What is the raw material used ? From where is it obtained ?

(c) What is manufactured ? Is it used in the village or exported ? Where is it exported ? Why ?

(d) Why is the mill located at this particular place ? Consider power, market, raw material, easy means of communications.

Find out how many people live in the area surveyed. How does the density of population compare with the neighbouring districts ? What is the source of water supply in your village ? How can you improve it ? Make a list of diseases and epidemics which affect your people. How can the people protect themselves against these ?

How is the administration of your village carried on ?

What can be done to improve your village ? Draw a plan of your village showing the features of its surface, rivers, canals, railway lines, roads, and the position of the important neighbouring towns ? Write a short history of your village emphasising the events of general history which have occurred near it.

Now the question arises from where to get information for these topics, and for teaching the geography of everyday occurrences. The geography text-books are hopelessly inadequate. In Morrison's *Geography of India* even in the edition which was published in 1924 there is no mention of Jamshedpur or of Tata Iron and Steel Works, and the amount of annual production of coal in India is given as 12 million tons, actually now-a-days it is 24 million tons. In fact no text-book of geography can remain up to date, the world is moving so fast. The text books cannot be expected to give all this information. But the teacher of geography must keep himself up to date. He should study the magazines and the bulletins and the reports issued by the Provincial and Central Governments of India. The most important of these are the Season and Crop Report, the Reports of the Agricultural Department, the Railway Department, Irrigation, and the Trade Reviews of the Government of India, and the Census Report.

Every teacher should also carefully study the *Gazetteer* of the districts in which the school is situated so that with its help

and by his own observations of the surroundings he may be able to know something of the characteristics of the surroundings and the characteristics of the climate, the soil, crops, methods of agriculture, insect pests, useful and harmful birds, minerals, industries, habits and customs of the people. It is this knowledge which will enable him to take interest in excursions and guide the study of the local geography by his pupils. The Government of India publishes excellent survey maps of all localities in India. These maps, on large scale, of the village and its surroundings should especially be used when making excursions.

From the above discussions my conclusions are :—

1. The modern conception of the function of geography is to train future citizens to imagine accurately the conditions of the great world stage and so help them to think sanely about political and social problems in the world around.

2. In rural areas especially the teaching of geography should be given an agricultural bias.

3. The geography of everyday occurrences should be utilized for creating interest in the subject.

4. Regional geography is simply a method of teaching geography, it is not the be-all and end-all of teaching.

5. Blue books, bulletins, magazines, reports of Government, especially Season and Crop Report, Irrigation Report, Report of Agriculture, Railway Report and Trade Review and Census Report should be utilized by teachers in keeping themselves up to date and pupils should also be taught how to get information from these books of reference.

6. Regional survey of small areas should be carefully made in Upper Middle and High classes.

Now gentlemen, if you wish that the teachers of geography should be trained to do their work efficiently it is necessary that they should devote sufficient time to the subject while under training at the Central Training College. The students who take up history and geography as their special subject have never studied geography beyond their school stage and there are some who have not studied it even in the High Classes. How can you expect them to be efficient teachers of both these subjects in six months ? In case of students taking up Mathematics and Science, it is expected that they are graduates in these subjects, why not in case of geography also ? Moreover history and geography are two separate subjects. In all other Universities in India for the purpose of training, they are considered two separate subjects. I therefore move this resolution for the consideration of the Conference :
 “ That this Conference recommends that in the B. T. and the S. A. V. classes, History and Geography may be considered two separate subjects and the student may be allowed to take either of the two as his special subject.”

TEACHING OF SCIENCE TO WOMEN.

By Miss S. W. HARRISON, M.A. (OXON), A. I. C.,

Lahore College for Women.

I have been asked by the Science Section of the Punjab Educational Conference to give a short address on the teaching of Science to women.

I will mention first two difficulties which have to be contended with in teaching Science to girls in the Punjab, one is the keeping of purdah, and the other the question of dress.

About 40% of our students keep *Purdah*. This offers no difficulties throughout the course as they are taught by women but when it comes to examination it means that either the girls must be examined at the Lahore College or they must have a special room and a special lady examiner provided. This means additional expense and extra trouble to the University to arrange, added to which it is sometimes difficult to find a suitable lady examiner.

The dress of the girl students was a continual source of anxiety to me at first as I was always afraid of their flimsy *saries* catching fire. The girls are however very clever in their movements and can manipulate apparatus without any difficulty just as they play games in clothes which would heavily handicap any English girl. I was not happy however until I saw the girls safely clothed in overalls of *dasuti*, which serve to protect their clothes from acid burns and stains as well as being more or less fire proof.

I should like to support Dr. Dunnicliff's suggestion that general elementary Science be made a compulsory subject for Matriculation and that a higher standard of English in Matriculation be insisted on. The course for Intermediate Chemistry and Physics is very heavy and when girls come knowing practically no English and no Chemistry it makes a great rush to get through the syllabus, whereas if they understood when one spoke to them in English and knew even the composition of air and water and how to weigh on a chemical balance it would be a great help. I was glad to hear from Mr. Langhorne in his address on the teaching of English yesterday that in his opinion a large percentage of matriculated students failed to benefit from a college course simply because their knowledge of English was so elementary.

Now if it were made compulsory to take Science for Matriculation it would mean that any school which catered for the high classes would have to be equipped with simple laboratory apparatus. This being so the children could be taught Science in the lower classes, as they are in England, and I should

advocate some Domestic Science being included in the middle classes. By Domestic Science I do not mean cooking and needle-work only, but the Chemistry of food stuffs, for instance, the composition and analysis of milk might be determined in an elementary fashion, various kinds of starchy foods examined, etc. This would prove useful for the girls who left school to be married and did not proceed with higher education. With regard to the junior forms, the kindergarten and first and second forms should be taught Nature Study. Mr. Wilsdon in his address on the orderly mind yesterday spoke of Botany and Zoology as being only destructive labelling! I am sure this statement must have caused many a keen biologist to writhe in his seat. This taunt may have been true in the olden days but it is certainly untrue to-day—painting a flower is much more popular than measuring the area of a triangle and trains the child's power of observation just as well as pulling it to pieces. Any child loves a garden or a field and is much more likely to ask when a flower pot or garden roller is moved, "why is the grass all white?" than to trouble much about the movements of the moon. Animals and plants are near at hand and are of absorbing interest to children. The child can be led by means of the flower pot observation to study the effect of growing plants under different coloured glass and so find out why the grass becomes white when light is excluded. Other simple physiological experiments may be performed to find out how the plant responds to other stimuli such as water, touch, gravity, etc. The germination of seeds without soil is a thrilling proceeding. Animals are as exciting as plants to study and their habits are a further delight. Once a child's love of nature has been aroused a walk becomes a thing of pleasure instead of the dull routine it used to be. Speaking as a chemist I think elementary chemistry can be made very attractive, but I should certainly defer mechanics for girls to as late a period as possible as they are not as a rule interested in the subject.

Comparing boys' and girls' work in the laboratory I have found boys more handy than girls. By this I do not mean that they are necessarily better manipulators; in fact I think girls are more accurate than boys when it comes to routine work (this was found to be so during the War when girls had to be employed in the various factories) but a boy's brain is more fertile in making an alternative bandobast, he is not held up completely for lack of a piece of apparatus but exercises his ingenuity to provide an alternative.

Girls are cleaner in their work, though slower, and take much more pride in their note books which are kept as a record of laboratory work. A boy's note book leaves much to be desired in this way and his diagrams are generally unrecognisable.

Comparing the Indian girl with the English girl, the Indian girl is slower in her work. This is largely because English girls

are accustomed to do things for themselves, but an Indian girl expects to have her beakers and test tubes washed for her as she has an innate fear of soiling her hands. Indian girls are, however, very adaptable and soon get over this. I find that the Indian girl has also, at first, no initiative in the way of arranging work. If, in an examination for example, she is asked to analyse a substance and in addition to carry out some volumetric work which involves making up solutions she will start off gaily with the analysis and then be held up with nothing to do, while waiting for a substance to dissolve. I frequently find myself walking round a class urging them to look ahead and see what they can be doing while waiting for something to boil, perhaps.

Apart from practical work, the Indian girl is logical and good at deduction and some of the girls I have taught in India have been equal or superior in this way to English girls of the same age, and considering how entirely new and strange practical work must be, they do it very well.

TEACHING OF PHYSIOLOGY AND HYGIENE TO THE MATRICULATION CLASSES.

BY MR. B. L. BHATIA, M. Sc., F.Z.S., F.R.M.S.,

Government College, Lahore.

I read another paper on the teaching of Health in the Schools before the Health section of this Conference yesterday. In that paper I have indicated that the goal of our hygienic training at school should be to develop a health conscience among the boys, by checking bad habits and encouraging good ones. Further, that for the majority of boys studying in our schools the formation of healthy habits rather than formal instruction in hygiene should be the aim. In that paper following the advice of Prof. Kenwood I have chalked out a scheme for hygiene teaching for the various departments in a school. In this paper, I shall discuss the subject of the teaching of Physiology and Hygiene to the Matriculation classes. This is in accord with the opinion of Prof. Kenwood, who is of opinion that formal instruction in Hygiene should be given to the boys and girls during their last two years at school. It is not necessary here to dwell on the importance of the teaching of elementary Hygiene in a rational manner, that is on the basis of and along with elementary Physiology. Such a course has been in existence in some of the Punjab schools now for more than 15 years. When I was first appointed examiner in Physiology and Hygiene, the number of candidates taking up these subjects was very small, teaching inefficient and equipment very poor. But during the years that have passed since, considerable progress has been made so far as the teaching of these subjects is concerned. The number

of candidates appearing in these subjects for their Matriculation is between 2 and 3 thousand, a large number of schools have got proper equipment, and efficient teachers are taking the place of inefficient ones. All this is very encouraging, but there is certainly room for further improvement.

Importance of these subjects.—What knowledge is of most worth? Long ago, Herbert Spencer discussed this topic in his book on Education, and had no difficulty in showing that knowledge of the working of one's own body should be regarded as of greatest importance and usefulness. We do not trust the running of an engine to any one who has not the requisite knowledge about it, but every one of us is in charge of a delicate and complex mechanism, about the working of which the majority of the people—even the majority of educated people—are in complete ignorance. Most of us are, in this respect, like the majority of owners of self-driven cars, who can simply run them about, but ignorant of the mechanism are not getting the best possible service out of them, and on the occurrence of the least derangement have to send the car to a "hospital" or to call a "doctor" on the spot.

Apart from the usefulness of these subjects from the point of view of subject matter, they are as effective as any other in the school curriculum for the purpose of training the hand and the eye, through experiment and observation, as in other sciences, and their study can thus be recommended for general culture. The study of Physiology and Hygiene is thus useful both from utilitarian and cultural point of view. Elkington has said that "Hygiene is a subject which fulfils admirably the teaching requirements of seeing, reasoning, and remembering; it lends itself to both training and instruction; and possesses high material and ethical value. When it is added that fullest regard must be paid to the physical health of the child in order to obtain the best mental reaction, it must be admitted that hygiene is a close and natural ally of the pedagogue". I need only add that Physiology fulfils the teaching requirements to even a greater degree than Hygiene, and the two together form an ideal subject for study at the Matriculation stage.

How these subjects should be taught.—In the teaching of these subjects, generally speaking the same methods should be adopted as in the teaching of Physics and Chemistry. Knowledge gained merely from the text-book (however helpful it might prove in securing marks in the M. S. L. C. examination) is not education. Physiology is nothing but an application of the laws of Physics and Chemistry to the human body. Throughout the course the actual objects under discussion should be available, and should be freely handled and carefully observed. Numerous simple experiments can be introduced and the teaching made thoroughly practical. Instead of talking in general terms, I shall mention

some of the objects and articles of equipment which can be readily obtained and studied.

Skeleton (articulated and disarticulated). The boys will note how the skeleton forms the frame-work of the body and gives it a definite appearance. They can freely handle the bones from a disarticulated skeleton, observe their general form, study the simple articulations, compare the action of certain parts of the body with the different kinds of levers; reason out why some bones are long, others short, some flattened, and some others of an irregular shape. Why there are pads of cartilage between the vertebrae? Why are there curvatures in the spinal column? Why are there so many holes in the skull? They can look into the cranium, and even measure the cubic capacity of the cranium. The relationship of the parts of the ear with the temporal bone, will be nothing short of a discovery for them.

The teacher is expected to demonstrate to the students the viscera in a dissected rabbit. This will not only give them an idea of the actual form and position of the various internal organs, but serve to impress upon their mind how it is possible to stow away so many articles in so little space, and how wonderful is the mechanism which lives, and works by itself. Division of labour, mutual co-operation and adjustment, and control from a central authority amenable to outside influences can be illustrated from the body in a most interesting manner.

For subsequent lessons in Physiology, the appropriate viscera from sheep or goat should be obtained from a butcher's shop at the cost of a few annas, every year, as the functions of these organs can be much better explained from these actual parts than from the best and costliest models. Where is the model of the heart which can explain the working of the valves, and the communication of its various chambers with the chief blood-vessels, as satisfactorily as the actual specimen can? Larynx, trachea, bronchi and their ramifications in the lungs can easily be observed, and the relationship of the heart and the lungs is deeply impressed on the mind. Similarly an examination of a sheep's kidney or sheep or rabbit's brain gives a more real and reliable idea of these parts than any models ever can. A dissection of the eye-ball of sheep, properly performed by the teacher, and demonstrated to the students, will serve to fix the structure of the organ indelibly on their mind. The annual recurring cost on the purchase of these organs from the butcher's shop will be only a trifling part of the interest alone on the capital value of the models which are sometimes purchased by the schools.

Now let me refer to a few of the many simple experiments which can be performed either without any apparatus whatsoever, or with a few simple pieces already found in the science department of every school. The beating of the heart in a freshly killed frog, especially if it is accompanied by a demonstration

under the microscope of the circulation in the web of the frog's foot is of great educational value. The students practise feeling the radial pulse, and afterwards can make it temporarily disappear by pressing the brachial artery in the arm. This single experiment which costs little time and no money, is an adequate proof of the fact that the blood flows in the body.

Counting the respirations per minute, and again after a boy has been made to run about the school building, will serve to impress what urgent need is there of respiration and consequently of proper ventilation in our rooms. Breathing is the readiest means of preparing a small but demonstrable quantity of Co_2 and water vapour and simple experiments are always performed to show these.

In a recently killed frog, the contraction of a set of muscles by simply pinching one of the nerves can easily be shown. Reflex action in the form of knee jerk, or the demonstration to prove the occurrence of blind spot in the eye, are other examples of experiments requiring no apparatus whatever. The use of the clinical thermometer, use of the lactometer, the formation of images at different distances with the help of a convex lens, and many other simple performances afford the requisite training for the hand and the eye.

Numerous other experiments can be devised by a clever teacher in connection with almost every lesson in Physiology and Hygiene. For studying the life-history of the mosquito or the house-fly, the material is ready at hand. Employment of commoner disinfectants and other methods of checking communicable diseases are of great practical value.

If a microscope is available, blood, bone-cells and muscle-cells and various simple preparations from the tissues of the body can be shown. Examination of a drop of milk, starch grains from potato or other articles of food, or again the examination of the proboscis or the leg of a fly or the wing of a mosquito, or cotton and woollen fibres or even the human hair, afford material for endless amusement and instruction. I have shown above that while the course can be made eminently practical, there is no need for an elaborate equipment. Some charts, an articulated and a disarticulated skeleton, a few dissecting instruments, and a microscope are all the necessary apparatus, and the cost of all these according to my estimates should not exceed Rs. 300 or so.

And now before I conclude I should like to say a few words regarding the training of teachers.

The Training of the Teacher.—A would-be teacher must be taught firstly how to maintain hygienic conditions at school, and secondly, how to train the school child to hygienic observances.

The teachers for our Primary Schools are mostly trained at Normal Schools and an elementary course of Personal and School Hygiene should be regarded as an important subject in the curriculum of such schools. Bearing in mind that the maintenance of hygienic conditions at school, the training of children in hygienic observances, and the simple hygienic precepts suitable for the elementary school child, demand only a small amount of real, practical and clearly arranged knowledge, it is not necessary to give them instruction in the theory of the subject or to carry them much beyond the essential facts of value in practical application.

From the pupils in the Training Colleges a much higher and sounder knowledge of the subject is to be expected. Some of them will be called upon to teach the subject to Middle and even High classes. Among men of this class it is necessary to arouse sympathy and respect for the subject, and so for them hygienic demands must be scientifically justified, and information derived from lectures and text-books should be verified by them personally, through experiment and observation. Physiology and Hygiene are on a different footing from all other subjects in the school curriculum. Teachers who teach English, Mathematics, History, Languages, or Physics and Chemistry to High classes, are almost always graduates, and have studied the subjects they are called upon to teach, up to B. A., or M. A. standards with capable teachers in Arts colleges and have them had the benefit of a further training in the method of teaching the subject, while at the Training College. Physiology is a subject for the Intermediate, B. Sc., and M. Sc. examination of the Punjab University, but no college has so far made arrangements for teaching the subject. The responsibility of the Central Training College in the matter of training some of their pupils to serve as efficient teachers in Physiology and Hygiene for the High Schools is consequently greater than in the case of other subjects. In my opinion, in the absence of graduates in Physiology, others who may have taken Zoology and Botany as subjects for their B. Sc., or even F. Sc. course, would be good material for being trained at the Training College as Physiology and Hygiene teachers for schools, as they will have the necessary biological foundation and requisite familiarity with biological methods and appliances. A systematic course of training in Physiology and Hygiene at the Training College is, in my opinion, a great desideratum.

THE INFLUENCE OF CLIMATE ON AGRICULTURE.

BY L. A. RAMDAS, M. A.,

Assistant Meteorologist.

Introduction.—The subject of the present essay is Agricultural Meteorology which lies on the border-land of two great Sciences, namely, Meteorology and Agriculture, both still in their infancy. A complete review of the effects of the meteorological elements on plant life is perhaps too vast a subject to be disposed of in a few pages. It may however be interesting to state the fundamental problems of agricultural meteorology in a way intelligible to the ordinary layman.

What do we mean by 'climate' and how does it vary over the different parts of the earth and prove conducive to the healthy growth of different types of plants? We may define climate as the resultant effect of the temperature, humidity, air pressure, environment, height as affecting strength of sunlight and wind prevailing at a place. These are directly influenced by the amount of solar radiation which is received by the earth. In fact 'climate' originally meant 'inclination' of the Sun's rays. The region between the tropics which lies under a vertical sun for the greater part of the year, therefore, receives most of the solar energy, the higher latitude sharing it in smaller proportions. The areas within the polar circles, which have the poorest supply of radiant energy, are termed the Frigid Zones, those between the polar circles and the tropics, where there is a tolerable abundance of radiation, the Temperate Zones, and the wide belt between the tropics, which is overflowing with solar wealth, the Torrid Zone. The equatorial region corresponds with the region of maximum heat and rainfall.

Plant life, as a rule, is most luxuriant where there is abundant sun-light, high temperature, copious rainfall and soil abounding in the soluble salts necessary for nutrition. In the course of ages plants have gradually been modified so as to adapt themselves to their environment. The luxuriance and variety of vegetation decreases from the equator to the poles. The Arctic Zone of stunted plants leads to the Frigid and that to the unchanging ice-deserts of the Polar Zone.

A detailed description of the various plants thriving in the different zones is unnecessary as we are at present concerned with Agriculture, that is, the systematic cultivation by *man* of those members of the vegetable kingdom, which he has found essential to meet his daily wants. When we examine carefully the history of man's labours on the fields his successes or years of plenty, and his failures of years of scarcity and famine, we find that he has always been depending on the good-will of the gods. If they are in a good mood, adequate amounts of rain and sunshine are

bestowed at the proper time. The crops fail, because the gods are angry. In the legends of all countries there are deities who preside over the meteorological elements and control them for the benefit of man according to his deserts.

Are we in a better position to-day with all our scientific knowledge than the primitive man? We now possess a more comprehensive knowledge of the seasonal changes that recur every year and the mechanism of these changes than previously; but the trouble is that these events do not follow each other exactly in the same way and to the same extent. The changes of climate along with the incidence of rain, heat, and dryness or moisture, do not appear to take place with mathematical precision and regularity. This element of uncertainty is the chief factor which baffled the primitive man and is still baffling us to-day. It should not, however, be supposed that we have admitted defeat. Modern science is a powerful weapon and it is for us to use it intelligently and effectively. The problem we have to face is the *prediction of coming weather accurately and sufficiently early, so that the cultivator knows what to do in order to secure a good harvest*. He can either take adequate precautions against bad weather or take due advantage to favourable weather.

The ideal arrangement would of course be the human control of weather. The public should not, however, be carried away by stories coming across the seas, of American rain-making machine and the like, not to speak of the rain-making stories or incantations of the primitive people. The achievements of science in this direction have been mainly restricted to invention for human comfort in inclement weather and their extension to plant specimens in glass-cases. In a cold country we are able to rear a tropical plant in a hot-house and perform small experiments of the kind in small rooms, but we are unable at present to exercise any appreciable influence over weather. Nature is yet running wild and free.

Recent researches in meteorology have revealed the fact that our planet is dependent to a large extent on the activity of the sun, for example, the frequency of sun-spots has been observed to influence the temperature of the earth and bring about subtle changes in the other meteorological elements. Man's powerlessness to control weather for the benefit of crops is also proved by the distribution of the yield of crops in North America and Russia from year to year. Arctowski states that in years of scarcity in Russia, America has very large yields and when the yields are in excess in Russia, North America is a centre of scarcity. If this is so, the powers that control the agricultural prosperity of different countries are perhaps so ordained as to compensate on the whole for scarcity at one place by plenty elsewhere.

It is gratifying to note, however, that human endeavour has been attended with better success in other directions. In recent

years, meteorological data have been carefully collected and preserved for future study. These records are available for a large number of stations more or less well distributed throughout the inhabited parts of the world and the statistics of annual or seasonal yields of important crops are also available in most of the civilised countries. These two sets of data when judiciously correlated will indicate how one might expect the yields of crops to vary with the several meteorological elements such as rainfall, temperature, etc., from year to year. America is the leading country in this field and the American Weather Bureau is doing yeoman service to the cause of agricultural meteorology. European countries are also taking a keen interest in such work. India should also do pioneer work in this direction and do justice to her own vast agricultural resources.

Scientific methods should be employed in our country to find out the minimum requirements of a plant at different stages of its growth in order that it may attain its normal growth at the proper time. If we know, for example, the lower and upper limits of temperature, humidity and rainfall that are beneficial to a particular crop, it will not be difficult to give suitable warnings or notices of favourable or adverse weather changes. To acquire this knowledge would require years of laborious and patient work and it is never too late to begin our researches seriously and systematically.

In this connection attention may also be drawn to the very interesting pioneer work done at the Agricultural Research Institute at Pusa on the water requirements of crops in India and on soil temperatures. The valuable results obtained there will be considered after the meteorological factors involved in India have been discussed.

Indian Meteorology.

In India, the activities of the Meteorological Department have, during the last fifty years, included the collections of reliable climatological data for a large number of well distributed stations. These data have been classified into monthly and seasonal averages, but no noteworthy effort has yet been made to determine their bearing on the Agricultural problems of the country except by S. M. Jacob, who has, in several papers of note, shown the correlation of areas of matured crops and rainfall so far as a very small part of the Punjab is concerned.

Rainfall.—India derives her rainfall mainly from the south-west monsoon which prevails from June to September, the north-east monsoon being less important as it affects only the eastern half of the Peninsula from October to December. During the winter months and, to a less pronounced extent, the rest of the year, northern India comes under the influence of a series of disturbances coming across Persia which give rise to appreciable rain and snowfall over that area and the Gangetic plain.

The following table gives the normal rainfall over the main divisions of India during the South-West monsoon period (June—September) in inches :—

Burma	—	.. 61"
Assam	..	.. 66"
Bengal	..	.. 55"
Bihar and Orissa	..	.. 43"
United Provinces	..	.. 34"
Punjab	..	.. 15"
N. W. Frontier Province	..	.. 8"
Sind	..	.. 5"
Rajputana	..	.. 19"
Bombay	..	.. 40"
Central India	..	.. 33"
Central Provinces	..	.. 41"
Hyderabad	..	.. 26"
Mysore	..	.. 22"
Malabar	..	.. 65"
Madras (excluding Malabar)		.. 18"

It will be noted that the heaviest falls occur in Burma, Assam, Bengal and Malabar.

The North-East Monsoon—The rainfall due to it is mostly confined to the Karnatic and the adjacent divisions till about the close of December and constitutes, in fact, the only rainfall season for this tract.

The Western Disturbances—In northern India rainfall occurs again during the year in connection with the *Western Disturbances* which are of great agricultural importance to north-west India as they occur chiefly during the *Rabi* (spring crop) season. They also cause snowfall on the hills, which melts during the summer months and feeds the irrigation canals.

These disturbances, during the winter months, i. e., from December to April, are usually remnants of depressions from southern Europe, and in some cases, from regions as far west as the Atlantic. They travel eastwards through Asiatic Turkey, but, after advancing further through the Highlands of Persia and Baluchistan, become less concentrated. While entering India, they often split into two branches, the northern portion giving precipitation over the Punjab and the adjacent hills, and the southern portion passing eastwards through Rajputana to Bengal and North Burma. Their course through Persia shifts northward in March, April and May and this causes snowfall in the mountains of Kashmir even in May.

The Agricultural Value of Rainfall in India.—The agricultural value of rainfall depends more on its distribution

as regards region and time than on the total amount during the crop season. The most important factors are :—

1. Period of commencement.
2. Period of termination.
3. Period of drought.
4. The character of the falls, whether chiefly occasional cyclonic downpours or moderate rain at frequent intervals.

From the point of view of the farmer, the period of commencement, if known beforehand with some degree of certainty, will determine the area he decides to sow and the time of sowing. The period of termination is important only because it affects the reaping and marketing of the ripe crops. The character of the falls and the intervals or long breaks in the rains are of primary importance to the agriculturist. A previous knowledge of these factors will be very helpful to the farmer who may safeguard his crops against scarcity or abundance of water. It is necessary, therefore, that a weekly forecast of rainfall be supplied to the agriculturists of the country.

In tracts like Malabar and the Konkan, which depend solely on the rainfall for successful crops, such information will always be found very useful.

These are, however, large tracts of land in India especially in the basins of her large rivers, which are irrigated by means of canals. In such cases a knowledge of the catchment areas over which the rainfall is drained into the rivers is very essential. In places like the Punjab, on the other hand, monthly snowfall amounts and prevailing temperatures around the sources of the Indus and its tributaries will provide data for estimating the river discharges.

It may, therefore, be seen that in India we require years of further study and practice before we can utilise our natural water-supply to the best advantage. The annual yields of the crops in India, if compared with the corresponding rainfall over a large number of years, shew in a striking manner the extent to which nature has had her sway in this matter. The graphs given below illustrate how little man could control the yields of crops. Fig. (1) shows the annual deviations from normal of the gross out-turn of cotton in Berar in thousands of bales along with the departures of the rainfall amounts to inches for that season. One would expect the two curves to follow each other. This they indeed do during years like 1896-7, 1904-5, etc., but the excessive rains in 1892-93 are accompanied by a poor yield. In fact, a careful examination of the figure shows that very excessive and very deficient rainfalls are both injurious to agriculture.

In figure (2) similar deviations of the gross out-turn of wheat in the Punjab expressed in thousands of tons have been compared with the corresponding rainfall departures from the normal for the years 1892 to 1917. Here too, exactly similar facts may be noticed, wheat crops suffered in 1901-2 when rainfall was poor and in 1892 when the rainfall was excessive. Apparent exceptions like poor rain along with good yield or good rain along with poor yield, when examined more in detail, are found to be usually due to a good or bad seasonal and geographical distribution of the rainfall, respectively.

It must not be supposed, however, that the relation of crop yields to the rainfall is quite as simple as it looks. While the close association between these two factors is seen in a general way in the above figures, the actual course of the "yield-graph" is controlled by a variety of factors.

According to Mr. Jacob "the variation in the out-turn of crops in India is a dual problem of the variations of the areas sown to each class of crop and the yields of these crops per unit of area. These problems are to be thought of as the fundamental ones of

(1) Quantitative Agronomics, of which Agronomic Meteorology is one of the most important branches, and (2) Agricultural Meteorology.

"Agronomic Meteorology is concerned with the weather conditions which induce the cultivator to plough and sow land or to refrain from ploughing or sowing it or affect his capacity to do these things," whereas Agricultural Meteorology "has to deal with the problem of the reactions of the plant, once the seed is sown, to the weather conditions, whether these are represented by the integrated effects of rain and sunshine and so forth prior to seeding, or to the meteorological factors current during growth." In an unpublished paper, the above author has elaborately discussed the possibilities of a statistical study of these two subjects and the psychological and physical factors involved in each case. It is not necessary to enter into details, but one may assert that Agricultural Meteorology is, from the statistician's point of view, the simpler subject.

We may now proceed to consider some experimental researches on the water requirements of crops in India that have been carried out at Pusa by Dr. Leather and his assistants. These results are rather interesting as they put the problems tackled on a more quantitative basis than before and show how useful similar data may be, if obtained at various representative stations over India. We shall then be able to study the relation of the minimum water requirements of crops to the actual rainfall, from time to time, and put the results of laboratory experiments to practical

use on an extensive scale in forecasting abnormal weather and utilising our natural resources in the best interests of the growing crops.

Water requirements of crops in India.—The water requirement has been determined by finding out the total weight of water transpired by the plant during its whole lifetime. This quantity has been expressed as the “transpiration ratio” i. e., the weight of water transpired per unit mass of the dry plant substance produced. The quantity thus expressed has been found to depend on a number of factors like—

- (1) the fact of manure,
- (2) the nature of the crop, etc..
- (3) air temperature and humidity, etc.

The effect of a suitable manure in aiding the plant to economise water is the most important factor noticed in the experiments. In fact, all agencies which help healthy development have been found to diminish the transpiration ratio, i. e., the water required.

TABLE I.

		TRANSPIRATION RATIO.	
		<i>Unmanured.</i>	<i>Manured.</i>
Cold Weather crops	{ Wheat	850	550
	{ Barley	680	480
	{ Oats	870	550
	{ Peas	830	530
Monsoon crops	{ Maize	450	330
	{ Arhar	1,000	600
	{ Guar	1,100	600

The amount of water transpired per unit time is increased by the rise of air temperature and decreased by the rise of humidity. On a wet day the transpiration is approximately a quarter of what it is on a fine day. During the initial period of growth of young plants, however, the daily increase in the plants' energy is so great that the effect of an increased humidity is not so marked on transpiration. Humidity merely retards the rate of loss of moisture from the plant fibre. In adolescent plants, however, continuous wet weather leads to protracted suspension of transpiration. This fact certainly accounts for the yellowing of crops during persistent bad weather.

The period of greatest water requirement is after the plant commences to “shoot” until very near the time of maturity when

the transpiration again diminishes rapidly. The following table gives the period for a number of crops :—

TABLE II.

Crops.		1st period, sowing to 1st rapid development.	Days.	2nd period of greatest water requirement.	Days.
Cold	{ Wheat	Oct. 30th—Nov. 30th.	30	Nov. 30th—Mar. 29th.	119
	{ Barley	Nov. 2nd—Dec. 4th.	43	Dec. 1st—Mar. 4th.	94
	{ Peas	Nov. 2nd—Nov. 24th.	20	Nov. 24th—Feb. 28th.	96
Monsoon	{ Maize..	July 23rd—Aug. 12th.	20	Aug. 12th—Oct. 18th.	68
	{ Rice ..	June 10th—July 11th.	31	July 11th—Dec. 8th.	150
	{ Guar ..	June 11th—June 26th.	15	June 26th—Nov. 23rd.	15

From the large mass of experimental data obtained, Dr. Leather has computed the rainfall in inches to which the transpiration ratios would be equivalent, after assuming that an unmanured crop will weigh 1,000 lbs. per acre and a liberally manured one 5000 lbs. per acre.

The table below sets out his results.

TABLE III.
Cold Weather Crops.

			<i>Assumed weight of crop in lbs. per acre.</i>				
			1,000	2,000	3,000	4,000	5,000
Wheat	{ Tr. ratio	...	850	775	700	625	550
	{ Rain (inches)	...	3.7"	6.8"	9.3"	11.0"	12.1"
Barley	{ Tr. ratio	...	680	630	580	530	480
	{ Rain (inches)	...	3.0"	5.6"	7.7"	9.4"	10.5"
Oats	{ Tr. ratio	...	870	790	710	630	550
	{ Rain (inches)	...	3.8"	7.1"	9.4"	11.1"	12.1"
Peas	{ Tr. ratio	..	830	750	680	600	530
	{ Rain (inches)	...	3.7"	6.6"	9.0"	10.6"	11.7"

Monsoon Crops.

Maize	{ Tr. ratio	..	450	420	390	360	330
	{ Rain (inches)	...	2.0"	3.7"	5.2"	6.3"	7.2"
Jwar	{ Tr. ratio	...	400	400	400	400	400
	{ Rain (inches)	...	1.8"	3.5"	5.3"	7.0"	8.8"
Arhar	{ Tr. ratio	...	1,100	970	850	720	600
	{ Rain (inches)	..	4.9"	8.6"	11.2"	12.7"	13.2"

It will be observed that the computed equivalents represent only that part of the actual rainfall that the crops would utilise for their transpiration. Other factors which raise the rainfall requirement are the poverty of the soil in water and the rate of evaporation from the ground. At the end of the hot weather in India the upper soil is so desiccated that a very considerable amount of rain is required before any crop can be expected to grow. The moisture retaining qualities of different types of soil differ considerably and this also modifies the rainfall requirements of crops to a large extent. One may see, however, that further research work on these lines would prove highly interesting and useful both to the agriculturists and the meteorologist who wishes to deal with agricultural problems.

Effect of Sunshine on Plants.—Having discussed the water requirements of plants we may now pass on to other factors which are essential for plant-growth of which sunshine is perhaps the most important.

Plants decompose carbonic acid derived from the atmosphere restore the oxygen to the air and cause the carbon to combine with the elements of water, forming starch which is stored up in the cells of the leaf. These activities are essential for plant-life and can go on only when sun-light falls on the green colouring matter known as chlorophyll. We all know that a plant kept in the dark fails to grow properly and becomes pale and elongated. The amount of sun-shine and length of day have also an important bearing on seed reproduction and the maturing of crops. It is well-known that bright, sunny summers are unusually favourable for most fruits.

Soil Temperature.—In India we know very little about the influence of the soil temperature on crops. Daily records of temperature at standard depths below ground level will be found very useful in this connection. Experiments made in Egypt show that, when the soil attains a high temperature during the months of July and August the soil gets partially sterilised and hence unfit for successful cultivation. If, however, the land is kept cropless during this period, all other factors detrimental to plant-life apparently disappear, this beneficial effect being permanent up to a depth of 5 centimetres. Though ignorant of the scientific aspect of the question, the Indian peasantry have long recognised the fact that fields laid fallow improve considerably in fertility, but it is, of course, necessary to improve our knowledge of this subject by further research.

Effects of Thunderstorms.—Thunderstorms are most frequent in India during the transition periods of the monsoons, i.e., during May-June and October. The exact nature of their influence on crops is at present little understood. The Punjab peasantry seem to experience adverse effects of gram-crops, if thunderstorms occur during the flowering period.

Frost Hazards. In almost the whole of India crops usually fail only when a sudden heat wave passes through the country or there is too little or too heavy rain, but in countries like Europe and the United States, there is a great danger of crops and fruits in orchards being destroyed by frosts. So far as India is concerned, the latter evil is confined mostly to the Punjab.

The conditions most favourable for frost are a clear night and a still, dry atmosphere. The main factor is the radiation of heat from the earth and the consequent cooling of the ground and the air in contact with it. When heavy clouds cover the sky or the air is very humid, loss of heat by radiation to the upper limits of the atmosphere from the earth is retarded, and frost is very unlikely under such circumstances.

The following table shows the number of occasions on which the Grass Radiation thermometer recorded temperatures below 32° F. at Lahore :—

Year.	January.	February.	March.	November.	December.
1916 ..	17	7	0	5	25
1917 ..	21	9	1	11	14
1918 ..	23	9	0	5	16
1919 ..	13	4	0	0	14
1920 ..	16	9	0	6	20
1921 ..	21	15	0	0	5
1922 ..	11	1	2	3	9
1923 ..	11	1	0	4	14
1924 ..	15	5	0	10	10
1925 ..	22	19	1	6	31

December and January are therefore most liable to frost. The farmer can be helped to take precautions as it is possible to predict the likelihood of frost occurring at a given place. It will be only necessary to get details of wind direction and velocity, clearness of sky, humidity and temperature from the area concerned. The method of protecting crops from frost in America are given below and may usefully be employed in our country also :—

1. Covering with glass, cloth or lath screens for gardens and small areas.
2. Adding moisture to the air by means of smudge fires of damp straw or manure.
3. Spraying trees or crops with water to create a layer of humid air which would prevent loss of heat by radiation from the ground.
4. Adding heat to the air by a large number of small fires lit at several places. This method is specially suited for orchards.

5. By producing smoke screens to cover the crops. The efficacy of this method is questioned by some writers, but good results may be obtained if the air is still so that the smoke is not blown away.

Conclusion.—In view of the supreme importance of agriculture to India the State may, of course, take the initiative in the matter of establishing special institutions or departments; but the writer ventures to suggest that the Indian universities should also take an active interest in the agricultural problems of the country and make due provision for the study of these subjects in the schools and colleges. This is specially important in view of the ignorance of our peasantry.

(The writer's best thanks are due to Mr. Nigahia Ram, belonging to the Special Section of the Meteorological Office for general help and the preparation of the charts showing the dependence of crops on rainfall.)

References.—

1. Indian Meteorological Memoirs, Vol. 21, Parts 10, 11 and 12.....Gilbert T. W. Walker.
2. Studies on climate and crops, by Henryk Arctowski. Bulletin A. American Geographical Society, Vol. XLII, July, 1910.
3. Memoirs of the Department of Agriculture in India, Vol. 1, No. 8, January 1910.
4. Indian Meteorological Memoirs, Vol. 21, Part 14.
5. Indian Meteorological Memoirs, Vol. 21, Part 7.
6. "Crop and Weather Data in India and their Statistical Treatment", by S. M. Jacob. (Unpublished).
7. Same as 3.
8. Ministry of Agriculture, Egypt, Technical and Scientific Service, Bulletin No. 31.
9. United States Department of Agriculture, Farmer's Bulletin No. 1096.

THE DISTRIBUTION OF PLANTS IN THE PUNJAB.

BY LALA MOHAN LAL SETHI, M. Sc..

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My remarks this afternoon apply to the Panjab plain only. The flora of the Panjab Himalayas is so different from that of the plains, that it is neither practicable nor desirable to deal with both at the same time. I propose first of all to discuss the factors which determine the distribution of plants in general. Light, heat, soil, winds and water are the chief of them. Leaving soil, all the other factors can be grouped under climate. The climate of the Panjab plains is determined by their distance from the sea and the existence of formidable mountain barriers to the north and west. The winter or north-east monsoon does not penetrate into the Panjab, where light northerly and westerly winds prevail during the cold season. What rain is received is due to landstorms originating beyond the western frontier. The branch of the summer or south-west monsoon which chiefly affects the Panjab is that which blows up the Bay of Bengal. The rain clouds striking the Eastern Himalayas are deflected to the west and forced up the Gangetic plains by south-easterly winds. The lower ranges of the Panjab Himalayas receive in this way very heavy downpours. The rain extends into the plains, but exhausts itself and dies away pretty rapidly to the south and west. The Bombay branch of the monsoon mostly spends itself on the Ghats and in the Deccan. But a part of it penetrates from time to time to the south-east Panjab, and if it is sucked into the Bay current, the result is widespread rain. The Panjab is subject to extremes of cold and heat. During the winter the disturbances from the west which pass across the province are as a rule preceded by a rapid rise of temperature and succeeded by a large fall, and from time to time temperatures several degrees below freezing point are recorded even in the plains. In the summer which lasts from April to the end of June hot dry winds prevail in the afternoon and in May and June temperatures from 110° to 120° are recorded. The intensity of heat is relieved at intervals by the occurrence of a series of duststorms and thunderstorms which are sometimes accompanied with rain. During the monsoon the heat, although comparatively mild on rainy days, is still intense during the breaks in the rains. It begins to moderate about the middle of September and from the beginning of October, though the days are still hot, the nights are fairly cool. The months of October, November and the greater part of December, during which weather is generally dry and temperature is falling rapidly, form in fact the most pleasant part of the year in the Panjab.'

On an average the east and north districts receive more rainfall than the south-west districts. Among the former the

sub-montane districts receive the heaviest downpours. ' There is with the single exception of Sind, no portion of India which is so fortunately situated as regards its rivers, or so unfavourably situated as regards its rainfall as the Panjab proper, that is to say, the tract between the Jhelum and the Sutlej. By far the greatest part of the tract has less than fifteen inches a year and much of it less than ten. When it is remembered that these small amounts are liable to serious difficulty in a year of drought, it will be readily comprehended that until the introduction of irrigation, practically the whole vast stretch of country was desert waste. The only exceptions were fringes of rivers where cultivation though never very prosperous was rendered possible to some extent at least by means of inundation canals or wells.

Soil—The soil of the province may briefly be described as alluvial clay with a variable quantity of sand in different parts. In some places the soil is impregnated with salts. Such soils are termed Kallar soils. There are very large areas of such soils in the Montgomery district, etc.

Práin divided India into six botanical regions and included Sind, Rajputana, and the Panjab in one region calling it the *India Deserta*. Hooker divided British India into nine botanical regions and he also placed the Indus plain including the Panjab, Sind, Rajputana, Cutch and northern Gujerat together in one division.

Of all these climatic and edaphic factors which have been discussed rainfall plays the dominant part in determining the vegetation of a country. This is due to the fact that all plants absorb nutriment in the form of solutions. Thus the physical presence of water is essential because it serves as the solvent in which various inorganic salts get dissolved. These dilute solutions are absorbed by plants. Water is chemically important also because the plants derive their supplies of oxygen and hydrogen partially in this form. It is no wonder therefore that plant-geographers classify plants into groups in regard to their adaptations to water.

Hygrophytes are those plants whose conditions of life exclude all danger of desiccation and in which a stagnation of the water which brings nutritive salts to the parts requiring them may be feared. Such plants naturally are found in wet and moist places where supply of water in the soil is abundant.

Xerophytes are those plants which have to economise their supplies of water due to a precarious supply in the soil and a heavy loss due to evaporation. They are generally found in places with a scanty rainfall. Thus they constitute the characteristic flora of deserts.

These *Hygrophytes* and *Xerophytes* are connected by *Tropophytes* which are intermediate forms in being *Xerophytic* during

one season of the year and hygrophytic in another season of the year.

Besides these may be mentioned the *hydrophytes* which grow actually in water.

The flora of the Panjab is very poor, not more than 400 species being recorded. A large majority of these are Angiosperms, two Gymnosperms, a few Periodophytes, a few Bryophytes, some Algae and Fungi. Several types of flora may be distinguished as they are found in the neighbouring countries.

I. *Desert type of flora*.—This has also been called the Egyptian type of flora because there are several plants common to Egypt, Arabia and the dry north-west India (the Panjab). From the climatic factors which have been discussed above it is obvious that leaving the fringes of rivers, rainfall is the limiting factor. It neither favours a woodland which requires at least 50 to 60 inches of annual rainfall nor a grassland which requires the rainfall to be evenly distributed throughout the year. The vegetation may be described as an open scrub of semi-desert in character. Scrub is commonly called 'Rakh' in the vernacular.

The characteristic trees of such parts are :—

Trees.—*Salvadora oleoides* (Pilu, used for rafters), *Cappari aphylla* (Karil or Karir, yields dela or tet), *Tamarix articulata* (Frash ; yields main), *Prosopis spicigera* (Jand), *Acacia arabica* (Babul or Kikar), and in some places *Phoenix sylvestris* (the date palm).

Shrubs.—*Calotropis procera* (Ak), *Apuntia* spp. (American Chittar-thor). These plants are found in the dry and arid regions of America. They have been recently introduced into India and because of the dry climate in some parts have found a very congenial home. *Ricinus communis* (arind), *Zizyphus nummularia* (Jharberi).

Herbs.—*Echinops echinatus*, *Xanthium stumarium* (Chhota dhatura), *Cnicus arvensis* (Bhur-Bhur), *Solanum Xanthocarpum* (Kateli, Kandeali), *Amarantus spinosus* (Kanta-nutia), *Alhagi marorum* (Jawasa), *Lyceum europeum* (Kangu), *Tribulus terrestris* (Bhakhar), *Convolvulus pluricaulis*, *Euphorbia prostate*, *Peganum harmala* (Harmal), *Sueda fruticosa** (Lana), *Salsolu foetida* (Sajji, mote lane), *Mollugo hirta* (gandi-buti), *Citrulus colocynthis* (Tumba), *Aerna Javanica* (Boi Kalaun), *Malcomia africana* (Chimaka, Patthar). This is a good fodder plant).

Very large parts of the Panjab were covered over with scrub but of late due to the construction of various canals such tracts have been cleared and are being cleared and brought under cultivation. A profound change has thus been brought about in the

*From these plants Sajji, a crude form of Soda, is manufactured in certain districts.

landscape. Rakhs may still be seen in isolated patches surrounded by cultivation. The sub-soil water has arisen in these Rakhs in many cases and certain other plants have migrated into the Rakhs.

In certain parts of the province the soil is impregnated with salts. Such parts pass under the name of Kallar soils as stated above. Here soil in addition to rainfall acts as a limiting factor. Such places are very poor in vegetation. Here are found some plants which characteristically grow along the sea-shores. It may be mentioned that the majority of plants can absorb dilute solutions of salts only. Strong solutions are not absorbed by most plants. The sea-shores are rich in water, but this water is very rich in salts. So along sea-shores, which act like physiologically dry tracts, only a few accommodating plants can grow. Chief of these are *Sueda fruticosa* and *Salsola* species.

Here also must be mentioned *Dalbergia sissoo* (Shisham), *Melia azedarch* (Bakain), *Morus alba* (Tut), *Albizzia lebbeck* (Siris), etc.

These are found in soils with a sufficient quantity of sub-soil water. These are leafless during the dry winter months and behave as xerophytes. They produce their new foliage every year in spring and behave as hygrophytes. These have been called tropophytes.

II. *The European type*.—There are a large number of winter annuals and weeds of cultivation which are common to the Panjab and the western countries. This is called the European type, as the flora of the intervening countries is not well known. These plants are hygrophytes and they are found in places where sub-soil water is abundant. Most of these herbaceous plants are burnt or dried up in the hot season.

<i>Ranunculus muricatus</i>	} Buttercups.
<i>R. scleratus</i>	
<i>Sagnia apetala</i> .	
<i>Mazus rugosus</i> .	
<i>Stellaria media</i> (common chickweed).	
<i>Oxalis corniculata</i> (Khatti buti).	
<i>Spergula</i> .	
<i>Euphorbia helioscopia</i> (Sunspurge or chatriwal).	
<i>Lathyrus aphaca</i> and other species (Rawari Rewan).	
<i>Vicia species</i> (Akra).	

III. *The tropical type*.—These are found in the rainy season, because in the months of July, August and September, the climatic conditions of the Panjab approach somewhat closely the conditions met with in tropics.

Corchorus trilocularis.
Corchorus sp.
Digeria arvensis.
Achyranthus aspera (Puth-kanda).

IV. Lastly may be mentioned the hydrophytes of the Panjab, i. e., those plants actually growing in water. There are about 10—15 species. The majority of these are cosmopolitan in distribution as the conditions are so very uniform in water.

(*Nelumbium speciosum*—*Kanwal*) Pinddadan Khan.

Nymphaea lotus (chota kanwal).

Potamogeton spp. *Nymphaea alba* (Nilofar) (Water lily).

Sagittaria gnanyancusis.

Zanichelia.

Lemna } duck weeds.

Wolffia.

Trapa bispinosa (Horn-nut, Singhra).

Utricularis sp. (Bladder wort). This is an insectivorous plant.

THE ASSIGNMENT SYSTEM IN THE TEACHING OF SCIENCE.

BY L. SOHAN LAL KHOSLA, B. Sc., B. T.

The introduction of the assignment system in our schools will be a real advance in teaching Science and will solve many of our difficulties and will produce fruitful results. This method consists in providing the boys with some work which must be distinctly set forth in clear and simple terms, neatly and properly written out with clear instructions to page, paragraph and the portion to be read out and all possible precautions. If any part of the portion requires explanation it should be given and modified accordingly. At the end of each assignment is put a series of questions carefully designed to test the comprehension of the pupil in his reading. Then give the references to further reading. Supervision is essential in this system.

In the case of my own students, they enjoy the work and do it wholeheartedly. This develops intellectual independence and creates exactness and interest. It saves time. Here the student uses the book for the purpose. This system means economy of time and apparatus. Here the teacher finds out his best and weakest pupils. My own experience with my classes tells me that this system which has been introduced by Dr. R. H. Whitehouse, I. E. S., is far superior to any system followed up till now specially in the teaching of Science. The results of my weekly examinations prove it. I began this system at first with the 9th class and when I found that the students of the 9th class superseded the 10th class in the weekly examinations when the same questions were given to both the classes I was forced to introduce it in the 10th class and found the class better than before.

The object of introducing this system into the schools is to give the scholars an opportunity of gaining their knowledge first hand. It will widen the mind of the boy, and will develop reasoning and imagination. England's greatness is due to those qualities being present in her people. Honesty, straightforwardness, perseverance, unity and above all the habit of being practical in all affairs of life are nowhere to be found so prominently as in the English nation.

Educationally for all elementary studies in Science, lecture work should not find a place in the time-table. No doubt much more of the syllabus is covered in a less time by lecture than by practical work, but lectures are not suitable. They are heard and forgotten. Remember "an ounce of practice is worth a pound of theory". By practical work the mind of the boy will be brought into direct relation with fact and this is what Huxley wanted. He said, "The great end of life is not knowledge but action. No one would attempt to learn carpentering or cooking or dressmaking by attendance at lectures." "The end of man is action and not thought". "Man is a tool-using animal."

The high cost of apparatus and material had much to do with present conditions but the low standard in High Schools impedes progress. Then too the institution of laboratory work among beginners always meets with the disapproval or at least hesitancy from conservative educators.

While a good deal of concern has been exercised as to whether laboratory work should be given double or single periods, in my own opinion not a great deal of importance should be attached to this question of time. However, there are several fundamental exercises which could not be done at all if the practical periods are single periods. I favour double periods in my own school.

No subject or study can be rightly pursued without the methods of observation and experiment. One writer says, "Wherever men work, in trade, in production, in Government or in courts, in charity or social reform, in education, in the home or church, they need the methods of Science in applying effectively the truths that science has revealed."

SUMMARY OF A PAPER ON SPECIALIZATION IN SCIENCE IN HIGH SCHOOLS.

BY LALA GIRDHARI LAL SURI, M. So.,

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The majority of Matriculants of the Punjab University have received only a literary education with the result that they are not equipped for occupations other than clerkships. It is a happy sign that Science is becoming more popular in the schools, but

the humanistic side of the subject should not be overlooked ; a knowledge of the life and work of great scientists like Galileo, Newton, Watt, Faraday, Darwin, Pasteur, Kelvin and Edison should form a part of the education of our boys. Our pupils should also learn about the great scientific achievements of the age which illustrate the application of the study of science to the service of mankind. The object of the paper was to impress the value of Science as a means of gaining livelihood and to show the necessity of including elements of applied Science as a part of the school curriculum. Technical education is surely needed in India, but it is essential that there should first be a ground-work in the principles of Science.

SUMMARY OF A PAPER ON THE VALUE OF STAMP COLLECTING.

BY MR. G S. JAURA.

Stamp collecting is a hobby which schools would do well to encourage ; it has a healthy influence on the teaching of geography. Stamps often have designs which are representative of historic landmarks of the countries or states from which they are issued. Artistic appreciation is also cultivated by this hobby of stamp collecting.

SUMMARY OF A PAPER ON THE TEACHING OF GEOGRAPHY IN PRIMARY CLASSES.

BY SARDAR BALWANT SINGH, B.A., B.T.,

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In his paper before the Science and Geography Section, the speaker emphasized the value of using good map and regretted that maps used are very poor. He drew attention to the excellent teacher-made maps to be seen at the Exhibition. Clay models, representing the area of a district were advocated, to be used in conjunction with maps. The speaker wished to see an Urdu Reader introduced in which children and people of other lands are described, after the style of " Bagh-i-Alam." Local industries and observation of the heavens and local surroundings were considered important matters needing attention.

GEOGRAPHY AND ITS PLACE IN EDUCATION.

BY LALA RAM AUTAR, B.A., B.T.,

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Mr. E. Tydeman in his illuminating monograph on the 'Teaching of Geography' writes :—

“It is probably safe to say that no subject in the school curriculum has received greater attention in the past quarter of a century than Geography. During this period the whole outlook on the subject has changed ; its scope and subject matter have been more or less defined ; its relation to other branches of knowledge has been determined ; the method of study has been made more rational—in a word Geography has taken its place as a Science.”

About thirty years ago Geography consisted of unrelated and uninteresting isolated facts about the earth. Political Geography in particular consisted largely of long and wearisome lists of place names, gulfs, islands, harbours, rivers and mountains which had to be memorized sometimes even without the aid of maps. This kind of Geography teaching afforded the students neither pleasure nor profit. In fact while this was the only known method good teachers also despised this subject as it appeared to be nothing more than a tax on the memory of their pupils. No wonder then, that students came to look upon Geography as a dry and dreadful subject. They came to abhor it to such an extent that the very name of Geography evoked sentiments of hatred in their minds. In these days we are suffering for the mistakes of those who taught Geography on such wrong and unpopular lines. There are many people even to-day who look upon Geography as a dry subject not fit for the serious study of a cultured man.

Naturally people began to question seriously the inclusion of Geography in the school curriculum. Gradually it came to be recognised that if Geography was to maintain its place in the curriculum it must prove its value. Consequently map-study and nature study were encouraged to make the teaching rational. Information which did not arouse interest was excluded from the matter taught. But still the different departments of the subject, the physical, commercial and political were independent of one another. What was still lacking was a unifying principle to make the subject rank as a science.

Advanced thinkers have now conclusively proved that far from being an unscientific collection of facts in which no principle of cause or law can be found, it is the science of sciences, bringing together the laws which are found in all and showing how physical laws affect climate, how soil and climate determine the

vegetable and animal life and finally how all these conditions influence human life. The physical geography is important only from its bearing on the human. Hence Geography is now defined as the study of the Earth as the Dwelling-place of Man and not simply the description of the earth.

In this definition is contained in a nut-shell the essence of the new aspect of Geography.

We study the earth because it is the Home of Man. There is no doubt, we depend upon many sciences for the explanation of geographical phenomena but the function of Geography is to see how far and in what way the various laws operate in determining or modifying human activities. According to the modern conception of Geography, the human aspect predominates and all the instruction is given with the object of explaining the relation of Man and his surroundings. I cannot bring out this important point more clearly than by quoting Mr. Welton who in his highly instructive essay on the Teaching of Geography writes :—

“ Geography thus is a fascinating story, telling us how Man has made the earth his home ; how he has used the land and the sea, the rivers, the plains and the sea-coasts ; what plants he has learned to grow ; what animals he has learned to tame ; what minerals he has dug up from the earth ; what towns and harbours he has built ; how he has divided the world into different countries, how he has been influenced by his surroundings and climatic conditions and how in turn he has conquered and influenced nature.

“ The earth is the Home of Man. Geography is the science of the Earth. When we learn Geography, we study what kind of a home earth is ; its land and its water ; where the mountains are and where the valleys and plains ; how the winds blow and carry rain-clouds from one part to another ; the hot parts and the cold parts ; where the dry deserts are found and the damp places full of springs and rivers and marshes ; what plants grow in different places ; what animals live in them and many other things. But a science teaches us the reasons of things. Therefore in the science of Geography we learn how mountains and plains have been formed and sea-coasts and islands ; why some parts of our world are hot and why other parts are cool, and why some are covered with snow and ice ; why winds blow in one direction and not in another ; why some winds bring rain or heat and others are dry and cold ; why in some parts there are dense forests or fertile plains, and in other parts very few plants can grow and the reasons for many other things we see on earth.”

Now if no one lived on the earth, it would not be very interesting to learn these things. But the earth is man's home and that is why it is interesting and useful to study Geography. Geography is thus the meeting place of all sciences and is a link

between the humanistic and scientific studies. It takes help from other sciences but uses the results arrived at by other sciences for its own particular needs, that is their effect upon man and his progress.

So long as Geography was an incoherent collection of facts, it could not rank beside those studies through which there runs connectedness and unity of idea, and teachers who reduced geographical instruction to a minimum could not be blamed. But modern geography claims to have unified its facts and to have become a science ; and so it has faced the question. In what ways for what purposes, in reference to what common ideas, does Geography seek to describe the surface of the earth ? The answer appears to be twofold. First it is true, that like Physics, Geography treats of heat and cold, of moving air and water; like Biology, it treats of plants and animal life, and like Geology, it is concerned with the formations that occur in the crust of the earth. But whereas those branches of science inquire how things are constituted, and how they can be explained, Geography inquires how they are distributed over the surface of the earth and if distribution is taken to include relations as well as positions, it may be regarded as the common idea which runs through the subject and gives it a unity. Physical Geography inquires how the natural features of the earth, its land and water area, mountains, rivers, ocean currents, heat and rain, are distributed; political Geography shows how men are distributed into races and nationalities and commercial geography "the science of distances" deals with the distribution of the economic products of the earth.

In Modern Geography the human interest outweighs the physical and the purely physical should be studied especially with reference to its bearing on human life. No part of the brief time which the school can give to Geography should be occupied with that which has no relation to man. What bears on human life inspires the deepest human interest and is of the greatest human value. When once it is realized that the world is a commercial unit and that we depend for the necessities of life on others then those men are brought into a human relation to us. A study along these lines will clearly show that the surface of the earth is a stage on which the drama of the world is being performed and that the earth is the store-house of man, the plains his gardens, the rocks his workshop, the mountains his fortress, the rivers his fountains, the oceans his pathway and the stars his guide and that we are either actors or spectators in that drama.

This much about the human aspect of Geography and its essential difference from the old conception.

Now to consider the claims of Geography to be included in the school curriculum,

Claims of Geography to be included in School Curriculum.

The first questions which are naturally asked in connection with any subject claiming a place in the curriculum of a school are :—

How does it help a child to develop his inborn faculties ? In what way does it broaden the outlook on life and make the students better men and citizens of the world ? In what way is it correlated with other studies as affording a valuable means for mental discipline ? How far are the varied interests of the child fully represented ? And what are the advantages of studying it ?

The greatest complaint in these days is that the school curriculum is overcrowded and the students are overworked and overburdened so that their physical development has suffered tremendously. The chief difficulty in fixing the school curriculum in every country is the claims of different subjects ; and the claims of contending subjects are not a very easy matter to decide. It is easy enough to make out a case for the inclusion in a curriculum of almost anything that is not immoral and people will push the claims of their pet subjects. The real and fundamental issue is how to fill the short and precious years of school life so that they may on the whole form the most effective preparation for the varied activities of adult life. What we need is clearly a standard of values which may enable us to judge as to the admissibility of any given study in the school curriculum.

Education means the harmonious development of the powers with which God has endowed us. " Education " really means " drawing out." We shall shortly consider how far Geography helps a student to develop his powers of observation and to broaden his sympathies. The ultimate aim of education is the formation of character. Its social aim is the making of a good citizen. Instruction in different subjects is given as a means to achieve the end. Whether the years spent at school be few or many, instruction must include in its purview the wide range of life's activities. The many-sided interests of child nature must be fully represented in any liberal scheme of studies.

The object of teaching Geography is to interest the child in his natural surroundings. The claims of the child nature demand that he should know the story of mountains and valleys and rivers that surround him, the solar system of which this planet is a part and the men with their joys and griefs, their thoughts, feelings and acts who along with him form its inhabitants. The claims of Geography to a place in the curriculum of an elementary school are obvious. A child loves the things which it can see and touch. We may begin to prepare for the teaching of Geography from the day that the child is able to look out to the horizon and to wonder what lies beyond the Here and Now by using his imagination.

It is true that any exhaustive treatment of the subject must be reserved for adult students. But even in its early stages it involves so many simple scientific facts within the range of every child's experience, such, for instance, as the varying altitude of the sun or the connection between rainfall and certain winds, that it provides frequent opportunities for sound training in observation and reasoning. It encourages a child to reflect upon his immediate surroundings; at the same time it stimulates thought and imagination about the world in which he lives and helps him to realize how, as civilization advances, communities come to depend upon one another for the necessities and comforts of life.

To quote Mr. Welton again :—

“ A knowledge of man, of the relation of man and peoples to each other, and of their dependence on physical conditions is of the utmost importance in determining the range of sympathies, breadth of outlook and grasp of human problems. For this reason literature and history have their high place in a true and complete scheme of instruction. Literature unfolds man's inner nature while history considers the development of nations and national spirit. Geography exhibits a third fundamental relation the physical aspect of man's activity in relation to the material things around him.

“ Geography is an outlook subject whose object is to enable young men and women to face the world into which they have been born.

“ Geography shows men of every race, in every part of the earth, under different circumstances of climate, soil and material resources, adapting themselves to their physical surroundings and their physical surrounding to their own needs and ideals. It deals with politics, commerce, industry, agriculture, customs and habits, religion, art and thought of the peoples of the earth, and enquires how these are dependent on physical conditions and suited to them. Though human forces have been operative, yet natural influences of soil, climate, material resources, natural defences, and means of communication that have had some part in the rise, progress, and decay of nations, in determining where cities and towns were built, in deciding where commerce flourishes and where it stagnates, and in stamping some people as tillers of the soil, some as herders of cattle, some as toilers under grounds, others as workers amid the smoke and noise of industry, and others still as roamers of the wide seas. It shows how mountain ranges, rivers, deserts, climate, and the blue line of the sea have moulded the life of a people and made for or against its progress.

“ Though its story at every point brings out the dependence of man on nature yet it exhibits man's industry, resource, adaptability, and unconquerable energy. When nature smiles and bestows her gifts in plenty man uses her with joy and gladness ;

when she frowns he rises stern and hard above her and subdues her to his will. He turns barren wastes into smiling fields, carves roads over rugged mountains and vast plains, harnesses the mighty forces of the seas, the heavens, and the rushing torrent, builds cities, harbours, fleets, and railroads, rivers, mountains, seas, winds, sun, moon, and stars, and the clouds themselves are all turned to use, and in the conflict the character of a nation is formed.

“ Much of our thought, our art, our code of laws, and our language we owe to other nations. Just as we receive the products of their hands, so we receive the products of their higher life of thought and culture, and we return each in kind. Geography essentially brings home to us our complete dependence on world-wide activities, human and physical. Through it we more consciously realise how many forces and how many hands and brains have worked in order to prepare not only the food we eat and the clothing we wear, but the knowledge we possess, the arts we admire, and the laws we revere. The story that Geography tells with man as the centre interest is a great one throbbing with human passion and interest and of vital human importance.

“ Breadth of human sympathy, insight into human nature, interest in human problems, and a full sense of the dependence of man on nature and on his fellows are, then, the effects of a right study of Geography ; and it is for this reason that Geography should hold as high a place in the studies of the rising generation as do History and Literature. This trio of subjects, each dealing with fundamental aspects of human nature, brings the child out of that self-centred individualism which is the main characteristic of the young and the uncultured.

“ The child is by instinct self-centred ; his inborn sympathies tend to narrowness ; his social activities move freely only in a narrow field within the family circle and among his companions. He views all questions mainly in their effects on his own welfare. Gradually as his experience widens and his activities develop, he begins to realise that there is a human world beyond his narrow circle, where life is more varied, wider, freer, and higher than his own. To extend his sympathies is the aim of the teaching of Geography. The advantages of travel in widening a man's outlook and enlarging his sympathies have long been recognised by all, though enjoyed by comparatively few. “ Travel in the younger sort ” says Bacon, “ is a part of education : in the elder a part of experience ”.

To study Geography is to travel in imagination, for the subject-matter brings distant peoples and lands near to those who stay at home.

The pupil should feel to the utmost of his imagination that the world contains other peoples differing widely from his own

in thought, in language, in systems of Government, in religious life, in national ambitions, and whose national tendencies lead in many diverging and sometimes conflicting directions. With this wider experience of the life of other nations, and with a fuller realisation of the interdependence of peoples, he can view himself and his own country in truer perspective. To know only ourselves is not to know ourselves ; to know ourselves truly we must know others. As Emerson says, " a foreign country is a point of comparison wherefrom to judge our own."

The other nations of the world should, then, be presented to the pupil with generous sympathy and with a sense of the dependence of his own on them and his duty to them. He will thus grow more tolerant of the national aims of others, be governed less by prejudices, become more sensible that there is room and need for every variety of national activity, and realise that all should live together in harmony and mutual forbearance, trying to see in all things what is the highest good of the human race.

Professor Cowham has very admirably summed up the just claim of Geography to a place in any liberal scheme of studies in the following words :—

" Geography is deservedly a very attractive and popular subject of school instruction. This arises from many causes, amongst which the following may be mentioned, *viz*:—(1) it satisfies the natural and almost universal desire to know something about places and people beyond the range of direct observation ; (2) it provides knowledge which the learner is immediately able to use in his general reading, (3) while awakening the interest and stirring the imagination of the scholar the facts of Geography are acquired without heavy strain upon his mental resources, (4) the study is naturally well suited to the age and mental condition of a child in early school life as it gives him opportunities for using his eye, ear and hand, and (5) lastly as it admits of pictorial illustration it becomes thereby increasingly interesting and popular." No subject, perhaps, can help to widen the outlook and broaden the sympathy of a child as Geography does. It gives him absorbing interest in the trials and difficulties of other people living in countries under climatic conditions very different from his own. It explains how climate and natural surroundings mould the character of the people and make one nation different from another. But most important of all is the bearing of Geography on political problems and issues.

The foreign policy of a country is influenced considerably by the desire to obtain markets for its own goods and to receive in exchange the products of other countries. Occasionally such a policy leads to wars. Any time some question concerning other countries might become the burning political question of the hour.

There is hardly a newspaper which does not make mention of some new situation arising in foreign countries. How can such

people fully understand the significance of political problems as are not equipped with a knowledge of geographical facts? A knowledge of geography thus invests newspaper reading with real and living interest.

Messrs. Archer Lewis and Chapman in their book on the teaching of Geography in elementary schools wrote the following before the outbreak of the Great War :—

“ Even while these pages are being written England finds that it has to face the entirely new situation of being confronted with a power which threatens our command of the sea.” We all know how prophetic this statement proved to be. I do not mean to say that the study of geography turns people into prophets but this much is certain that we can best follow the course of political events and can sometimes predict because political problems involve geographical issues.

RURAL EDUCATION AND COMMUNITY SPIRIT.

BY LALA LACHHMAN DAS VARMA, M. A.,

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The Punjab Department of Education has of late been engaged in a serious war against illiteracy and a fair measure of success has been achieved. But the task is by no means easy. A great deal of opposition has yet to be overcome before a decisive victory can be gained. The greatest difficulty is presented by the rural masses which form 9-10 of the population of the Province, a great majority of which consists of actual workers on land of their direct or indirect dependents. These being the producers of new wealth deserve first consideration. Yet these are the very people that elude our grasp; whom it is extremely difficult to induce to get to school. It would therefore be worthwhile to pause and diagnose the nature of the trouble, and if necessary to change our tactics to meet the situation.

The opposition offered is in most cases undoubtedly based on mere ignorance and conservatism, but the more intelligent members of the community offer more substantial grounds. Poverty is a very general and strong factor to which is ascribed the unwillingness of agricultural people to spare their sons for schools. In a country of small peasant proprietors, where the successful raising of crops requires every ounce of available energy it is not an easy affair for a farmer to spare his sons from direct labour on the field and from other subsidiary duties of his occupation. A boy may be indispensable to look after the cattle, another may be needed to help in minor operations on the farm, and yet another to protect the mature crops from the depredation of birds, etc,

Under these conditions this ground for opposition cannot be regarded as trifling. In canal colonies where holdings are comparatively large, and farmers are not entirely dependent on rains, this question of poverty is not as serious and the sons of farmers there are comparatively easy to secure for education.

By far the most serious objection advanced against school education is based on the belief that it renders the boy unfit for his ancestral work. I call this objection serious because it is unfortunately true. The school imparts an education which is by no means conducive to the welfare of the industrial professions. The entire atmosphere in the school is obnoxious to the proper development of a taste for manual work leading up to an industry. The comparatively long stay at the school under influences which are diametrically opposed to these prevailing in the boy's home, is enough to get the boy completely divorced from his ancestral occupation.

Instead of utilising his education for the furtherance of his parental industry we have the sad spectacle of a boy looking down upon that industry with scorn, and of an actual revolt against parental authority wherever it is to be enforced.

Another ground for opposition is provided by the perverted notions of the rural society regarding the career of the educated boy. From precedents established by the literate members of the society the chief aim of education has come to be regarded as providing its recipient with a situation in life out of the ancestral rut, where he could earn a living with greater ease and with less physical toil. If the educated boy fails to achieve this, his education is regarded as worthless, and nothing short of waste of years and money.

Under these conditions it is only natural that literate young men should leave their rural homes to seek clerical and industrial employment in towns. There is each year a constant stream of literate young men from the countryside pouring into towns with a view to earn a scanty living there. The towns suffer from this influx because of the keen competition for bread earning that invariably arises. But the rural population suffers three-fold ; (a) It suffers from the drain entailed upon their best intellect and brain, because the most brainy members of the rural society, finding it impossible to employ their ability on the agricultural and other rural pursuits, are forced to earn a pittance in town : (b) it suffers because it has paid for the education of these young men without getting a return therefrom ; and (c) it suffers because the drain of the literate to the town must necessarily retard the spread of literacy in the country, because of the dearth caused of men of education who could serve as teachers.

These are very serious problems which must be considered alongside the problem of the removal of illiteracy. These

problems are the direct outcome of our prevailing system of education, which is far too literary to suit the needs of the rural population. It is this system of education which is largely responsible for alienating the sympathies of the rural boys from their ancestral occupations, which render them physically unfit for the various professions requiring manual labour or physical exertion ; which has perverted the notions of rural society regarding the end of education and the future of the educated ; and which has indirectly helped in draining the countryside of its best brains. A change in this system is essential if we wish to carry literacy to the darkest corners of the Province. It is time that the Department of Education instead of confining its attention to enabling our boys merely to read and write, and to enjoy literature for its own sake, should undertake to give them that true education which would fit them better for their life's work. This is not the time for laying emphasis on literature, because literature cannot give pleasure to a man with an empty stomach. The economic conditions in the country have brought the literary man face to face with the problem of bread earning. An illiterate labourer earns more per day than an average literary man of the same status in society, and the conditions for the latter are becoming more and more worrying each day. The education imparted under the aegis of the Department of Education must therefore be such as to make it probable for the educated man to earn his living much more easily than his uneducated brother ; nay the education imparted must be such as would induce the educated boy to stick to his ancestral occupation, and by dint of his education to effect improvement in it. In short, the Department must be prepared to take strong steps to conform its instruction to the economic needs of the people. Unless it does this, any efforts at popularising education among the rural workers will not arouse a responsive enthusiasm.

As to what type of education would suit the rural masses, I cannot do better than reproduce an extract from Mr. Calvert's masterpiece "Wealth and Welfare of the Punjab", a book which all educationalists must possess as a guide. "There will always be need for the councillor and the lawyer," he says, "but the system of education must not be one specially designed to produce them. What this system should be is not easy to prescribe, but some general principles may be stated with confidence. It must awaken the youth to an appreciation of man's power over nature, to a realisation that progress largely consists in increasing power to harness natural sources to serve human ends. Where comparative poverty is the general condition, it must implant into the growing mind the idea of progress from a worse to a better state of things ; it must avoid that backward look, that dwelling on the past, whether it be a past of grievances or glories, that has done such infinite harm in poor countries ; it must implant a firm hope in a better future attainable by effort ; it must concentrate attention on the practical opportunities lying just

outside the school room door; and on the need of community action to seize and develop them. It must of itself provide an incentive to learn; whether education is to remain voluntary or to become compulsory it must appeal to the rural parent." Continuing the author says "What is required is an education that will fit agriculturists' sons to mix well with agriculturists. Experience has shown the almost insuperable difficulties of bringing the cultivator's sons to the school, the school must be brought to the cultivator's sons. If these will not imbibe what is provided for them, they must be furnished with what is more to their taste. The cultivating class cannot be ignored; it cannot be left in an unprogressive rut. The enormous potential wealth in the soil of the Punjab will be converted to actual wealth as fast as the cultivator can be taught to extract it and no faster. He is the custodian, the only possible custodian of the millions of acres upon the produce of which every one else is dependent. It would hardly be an exaggeration to say, that whatever principles and ideals of the educationalists may have to be sacrificed, the cultivator's son must be sent back to the land a better and more enlightened cultivator and a more intelligent and valuable citizen. Given a good teacher, one thoroughly conversant with his subject, and fully alive to the opportunities it affords of stimulating the intelligence of the growing child, there is very little that man requires to know that cannot be imparted through the medium of nature study."

As a case in point I might relate a personal experience. A few days ago, travelling along a country road in Hoshiarpur District, I noticed a small boy, about 4 years of age, and in nature's garb, sitting on the road, and busily engaged in something. On approaching him, I found that he had dug in the sand a small hole to represent a well. Near the edge of this hole he had struck up two uprights with a cross bar at the top. To this cross bar he had attached a lever, one end of which he had previously weighted and to the other end he had tied a thin string holding a piece of broken pottery, to represent a bucket. He had just found a correct point in the lever for the fulcrum, to keep up the right ratio between the power and the weight arms, and his miniature Dhekli was now ready for work. The boy was watching his little mechanism with a smile of self-satisfaction.

This incident set me thinking. Who had taught this little boy that had never been to school, the art of making a device with which he will have so much to do in his later years? What mysterious system of education had developed in him habits of keen observation; of correct thinking and of self-effort? Will our primary school present an atmosphere congenial to the further development of the rural instinct of this child? If not, why should this boy be forced to go to school? Literacy he can perhaps acquire in the school, but what is this gain if he is to lose the great gift of nature which should enable him to live a

fuller and happier life? Literacy could make his life far better if while acquiring it, the child can also develop his natural instincts and tastes. This little incident would also show what should be the meaning and aim of nature study.

Whenever an attempt has been made to introduce nature study in the curricula of our elementary schools and training institutions, it has always been and still is a complete failure. The reason is not far to seek. Nature study is not and should never be regarded as a school subject, "It is," to quote Professor Morgan "a process by which simple natural objects and events acquire meaning." It is not science, but spirit. It is at once a method and a basic medium of instruction particularly suited to the requirements of rural schools elementary as well as secondary. The old educational methods were adapted to the mentality of the few and were not of universal application. They are therefore getting obsolete. Taught in the spirit and with the method of nature study, the instruction in reading, writing and arithmetic will be purged of all its present horrors, especially for the rural child. When the material for the lesson in reading and writing is chosen out of the things the child daily comes in contact with, and when the problems in arithmetic relate to matters that the child deals with in his evening games with his play-fellows, the idea that the school is a place where uncommon facts and figures are being crammed into the tiny brains of the children, at the point of the ferule, will automatically disappear. Nothing will help in popularising education among the rural masses more than this. The new method is being tried with success in all the advanced countries, particularly in Canada and United States of America, and there is no reason why it should not succeed in ours. This method was first introduced in the Punjab at the Moga Mission School for village teachers, under the masterly guidance of Mr. McKee, an educationalist of wide reputation, and has been steadily followed and improved upon by his distinguished successor, Rev. Mr. Harper, under whose inspiring influence all of us are enjoying at the present moment, the privilege of conducting our proceedings. The results achieved at Moga have been highly encouraging. It is not only that the children have learnt to read and write well in a remarkably short time, but that a great deal has been done to cultivate their active and creative instincts as distinct from reflective and receptive instincts, mainly worked upon in our ordinary primary schools.

As to the actual details of the method employed, we should all anxiously await the privilege of first-hand information from the President himself. Briefly speaking, however, it consists in designing a project for each class, on which the instruction is exclusively based. Before commencing instructional work, the boys are thoroughly familiarized with the practical details of the project. Consequently there is nothing in the instruction which the boys are not already acquainted with, or which their little

brains cannot fully grasp and retain. The progress made is therefore rapid and the ground gained is firm. In selecting the projects, free choice is allowed to each class, but projects which are typically agricultural and rural are specially encouraged.

What has been tried with success at Moga, can be followed with similar results, in all our rural schools, only if the teachers are properly trained in the new method, and the Inspecting Officers are keen. Side by side with instruction in the three R's it would be a very useful thing if children in rural primary and lower middle schools are made to attempt tree planting, and a little gardening also, not with a view to learn the craft, but in order that their natural 'business' may be diverted along productive channels. The children will in this way not only satisfy their craving for doing something while at school, but will also be unconsciously taking interest in manual toil.

What is wanted therefore is a practical course of instruction based on nature study, with a view to draw out the rural instinct of boys and so to develop their power of observation and research, that education instead of being looked upon with dread, may prove attractive to the rural children. A purely literary and theoretical course has served its term and should now be regarded as obsolete. As agriculture is the principal occupation of the rural masses, the development of this branch of instruction necessarily needs special stress in the curriculum. Other industries and crafts should also be given prominence in localities where they predominate.

Agriculture as a practical subject has been recently introduced in rural vernacular middle schools, and school farms and garden plots attached thereto provide ample scope for the development of an aptitude in agriculture. If these institutions are properly utilised for their designed object, the main objection raised against our system of education will lose much of its force. Experience has conclusively proved that it is not a sound policy to keep a boy off the land during the earlier part of his life and later to bring him on to it quite suddenly. The estrangement effected in the earlier years of life, when the mind is most impressionable is, in most cases, too real to revive in him a genuine love for his ancestral profession. It is therefore necessary that the boy should be brought into actual contact with land and its problems as early as possible in his school career. Specialisation should however be permitted at a maturer age when the faculties are fully developed.

In the foregoing remarks an effort has been made to describe a few general principles that should guide us in determining a rational course of instruction in rural schools. But the problem of rural education is a much bigger problem to be solved than by revising the courses alone. Its right solution is intimately connected with the solution of the problem of a general rise in the level of

the rural masses in all directions, economic, social and intellectual. In fact the two problems are inter-dependent. The economic rise of the people depends on their intellectual progress and the raising of the intellectual level is not possible unless the economic condition of the people is greatly improved. The Development Departments like the Agricultural and the Co-operative are busily engaged in the beneficent work of improving the material and economic condition of the people, and the Department of Public Health is looking to their physical development. But the field of work is too wide and the task to be accomplished too heavy, for the resources of these Departments working individually and independently. It is only by their concerted and persistent efforts that an appreciable measure of success can be hoped for. A great deal of preliminary propagandist and educative work has got to be done before the masses can be brought into the proper receptive mood. To do this educational work the Department of Public Instruction is the best fitted, by virtue of its size and organization to serve as a connecting link between all the beneficent departments and the people. It is a matter for sincere congratulations to the country that the Education Department has recently given its consent to shoulder this new responsibility. In future the Department will not restrict its activities only to taking the light of learning to children living in the darkest corners of the Province, but it will also impart the masses in villages that education whereby they may be able to live a more healthy, prosperous and happier life.

The first step has already been taken in this direction by establishing rural community councils at the headquarters of districts. Magic lantern slides and cinema films have been prepared for the new work. The necessity of giving the rural school teachers a proper training to fit them for this work has been recognised and the community spirit is being steadily infused in the men undergoing courses in normal schools.

In some normal schools, particularly the one at Gakhar, the community idea is being vigorously developed. It is the wish of the Department to make the village school through the teacher an organised centre of activity for the social and economic betterment of the village people as much as it should be for their intellectual welfare. As time goes on, these village centres may ultimately be linked up with the one at the District Headquarters, from which they will continue to draw inspiration for the various aspects of their activities. The Headquarters centres may in turn be linked up with the Provincial centre under the control of the Rural Community Board. With the development of this huge organisation, the whole Province may at no distant date be pulsating under the influence of one common aspiration, namely, the awakening of Rural Punjab. The Hon'ble Mian Sir Fazal-i-Hussain, Revenue Member, Punjab, who has had much to do with the initiation of this community idea in the

Province, in explaining the guiding principle of his administration, said in a recent speech he made at Rohtak, "It is our object to awaken the rural Punjab from their deep slumber, to inspire them with a keen desire for self-improvement, intellectually, financially and physically and set them on the way to produce more and to profit more and thereby acquire means of further self-improvement." These are words worth writing in letters of gold and should serve as a motto for all people whose lot it is to work among the rural people. The task to be accomplished is formidable in the extreme and considerable disappointments may have to be faced in the beginning. But by patient and steady efforts, it should be possible to reach the goal. The workers however should be thoroughly well equipped and the necessary equipment must be supplied by the training institutions.

The time has come to consider seriously whether the Normal Schools should continue to concentrate attention on instruction in pedagogic methods, which are but indifferently practised in schools by the outgoing pupil teachers or should these institutions be utilised mainly for the purpose of giving such a sound training to teachers as would fit them to become trusted leaders of the rural community in the matter of bettering the village life and in that of effecting improvements in the social, moral, and economic conditions of the rural population. If both these aims are intended to be kept in mind, would it not be desirable to make the course in Normal Schools one of two years' duration? Again, under the present system of examination in the various subjects of the course the men under training in Normal Schools having provision for community work evidently stand at a disadvantage compared with those from schools with no such provision. The community work requires the expenditure of much time, and the men doing this work cannot possibly devote the same time and attention to other subjects, as they would have done had they not been doing community work. Is it not therefore desirable to revise the system of examinations in Normal Schools?

All these questions require solution and I take the liberty to place them before the Conference for such consideration as they deserve.

TRAINING OF RURAL TEACHERS FOR COMMUNITY WORK.

BY SARDAR SOHAN SINGH,

Headmaster of Gakhar Normal School.

The term community work though so simple and significant sounds strange to many an educationist of the old school and calls for a word of explanation. The term speaks for itself and

simply means work calculated to enrich village life and improve the village community which at present is sunk in ignorance and poverty and is deserving of the utmost attention on sanitary, economic, and social lines. It may be taken as synonymous with social service.

We live in a country of villages, 90 per cent. of the population being residents of villages. It is here where the greatest reform is needed. Sanitary, economic, social, and perhaps moral conditions are far from satisfactory. Thousands of people are swept by the epidemics like plague, malaria, and small-pox. The agriculturists or their dependents who form the bulk of the village population depend upon precarious rains. Their soils in some cases are very poor and their holdings small and scattered. Their implements are crude, doing minimum work with maximum labour.

Thanks to the warm solicitude of the Government, their lot has considerably improved but much yet remains to be done. The community itself contains the elements of weakness, the laws of inheritance materially counteracting our efforts for their improvement. If a father with two sons holds 20 ghumauns of land the holding will be reduced to half what it originally was in one generation until at last it will be reduced to a few marlas in a few generations, hence the necessity of improving the earning capacity of the cultivators and the productive capacity of the soil.

The social customs and practices have also a demoralising and debilitating effect on the rising generation. Early marriages predominate. Infant mortality and death-rate among the adult population present an appalling contrast with more civilized countries. Thousands of widows suffer for the whole of their lives. All this is due to lack of education. About 90 per cent. of the population are illiterate and the so-called educated community have got a distinct distaste for any sort of manual work and begin and end their lives with books and desks. On the other hand the toiling millions of India who work with their hands never use their heads. They have never seen a book or a newspaper and live in an atmosphere of cheerless isolation and drudgery.

If under the existing conditions of village life anybody could improve matters it is the village teacher and none else. He has splendid opportunities and heavy responsibilities. He is the centre of light and learning in the village and can rightly take his place as the leader of the village community and mould village life.

Community work like charity must begin at home, i.e., the school which offers splendid opportunities for mutual helpfulness, working for common ends of living pleasantly and profitably with others. Habits of cleanliness, habits of manual work, of thrift,

industry, truthfulness, punctuality, of organisation and administration could be easily formed. The school, the boarding house and the play-ground are the best training grounds for these traits.

A stupendous task lies before us. Half measures will not do. Bold action is called for. Let the training institutions represent the best and the noblest in the Education Department and let them no longer be the refuge of loungers and leisure hunters no longer required elsewhere.

Let the training of rural teachers for community work in training institutions commence with the method of teaching as the existing system is certainly responsible for stunting child growth and for driving out annually more than 20 lakhs of children from the infant class of our schools—an appealing waste of energy and money. On the very first day of their admission to the school the children are brought face to face with conditions which are most discouraging and unnatural. Their hobbies and predilections, their spirit for play, songs and dramas are ruthlessly disregarded. They are not treated as living beings but as so many chattels. Letters and their frightful combinations which are as foreign to them as Greek are forced into their little heads as so much saleable commodity to be taken out at will especially before the Inspector. When the time for testing the child's ability comes, the teacher's orders are "So far and no further." It is not the boy nor even the subject which counts for anything. It is so many pages which have been crammed into the head of the child by hook or crook and which are to be reproduced. The child disgusted with the school and its master runs away never to return.

If the children are to be prepared for life actual conditions of village life should be created in the school in order to make the transition from home to the school as easy and natural as possible. The Project system of teaching is the panacea for all these educational ailments and should at once be adopted in the training institutions as it will stop leakage and will make the atmosphere of the school an enjoyable one by bringing the school as near home conditions as possible. Stagnation and retardation will disappear.

Let gardening and agriculture be prominent features of every training school and let these be made the basic projects for our teaching. If this country is to rise as it must under the fostering care and the patronage of our benign Government it must rise through agriculture and its subsidiary industries.

Let the students of the school be divided into so many groups or families, each family in charge of a particular plot of garden and farm, besides one subsidiary industry like carpentry, smithy, pottery, rope-making, basket-making, poultry keeping, etc. A spirit of healthy rivalry could be started, the work

recorded from day to day or week to week and distinctly good work publicly recognised on the prize-giving day. These two industries—gardening and agriculture—will be like major projects of the training school and will afford ample material for hand-work, observational lessons, reading and composition lessons, arithmetic, geography, science, etc. Subsidiary industries like carpentry, smithy, pottery, rope-making, basket-making, blackboard-painting, varnishing school furniture, cooking, book-binding, tailoring and poultry keeping could be brought to the aid of these major projects.

The object is not to produce an army of skilled workmen and experts in these industries but to stem the tide of babuism or munshiism and to give the would-be-teachers an industrial bias, creating in them a love of and sympathy for their rural conditions of life.

One word of caution. It will be all labour lost and the object frustrated if the demonstration farm of the school presents a poor and melancholy contrast with the crops of the neighbouring cultivators. The object is to improve upon the present conditions of agriculture. If you have to better the lot of the agriculturist you must demonstrate to him the superiority of your own modes of cultivation, your implements, your method of manuring, watering, weeding, harvesting, etc. If you once succeed in establishing the superiority of modern methods of agriculture you have done a great act and vindicated the cause of an important industry with which is wrapt up the destiny of our land. You must keep in stock first-class seeds, plants, and implements for agriculture. You must dig commodious pits at convenient corners of your school for storing manure. Ploughing competitions should be held amongst the neighbouring cultivators and prizes, raised by public subscriptions, awarded.

The school-groups and families organised on a rural basis could similarly be held responsible for keeping their rooms and roads neat and tidy, for regulating the hours of work for the day's programme, for supervising study in the dormitories, for cooking and serving meals, for running the school library, the co-operative society and the adult school—in fact the students of the training school could be safely entrusted under proper guidance and limitations with the running of the whole school machinery. The school-zaildar should be the next dignitary after the school staff and should be held directly responsible for carrying out the orders of the school with regard to the various school activities. Thus the students will be directly associated with the organisation and administration of the school.

The health-board, study-board, games-board, co-operative club, kitchen-board, justice-board, sanitation-board, decoration-board, etc., could be organised in order to give every opportunity

to the pupil-teachers for practical and profitable work which they have to actually face when they return to the villages as village teachers.

Thus equipped with necessary training inside the school we should turn our attention to the nearest village or villages for actual work. Let the village be divided into so many portions and each portion put in charge of a particular group of students. The first few holidays should be devoted to surveying the existing conditions — sanitary and educational. The students should be taken to the village occasionally marching in military procession led by the school band if there is one. The dramatic and the songs-club of the school should also be pressed to our aid. The people of the village could be entertained by the school band and the school dramatic and songs-club. The people would come round. They should be addressed by the pupil-teachers on hygienic conditions of village-life and the measures the people should take in order to improve things. If this function could be preceded by an organised and orderly march with the band round and through the main streets of the village, the gathering will be larger still. This oral and preparatory work must be followed by practical work, *i.e.*, actually cleaning the streets and drains, removing the filth outside the village and burying it in pits dug up for the purpose. I would like to concentrate my attention on a particular area selected for the purpose dividing the students into so many groups for the various activities connected with this campaign. The slope of the drains must be attended to especially near the village wells to guard against the stagnation of water which ultimately sinks into the well and becomes the breeding ground of mosquitoes. This is bound to create a stir among the village-folk who will at first stand as lookers-on but will ultimately come to our help in the actual operations.

Let the village be divided into 4 or 5 portions as already stated and each group put in charge of a particular portion. Each group should subsequently be divided into so many sub-groups and each sub-group put in charge of sanitation, education, co-operation, cultivation, etc. The group in charge of sanitation will have to improve the sanitation of the area including ventilation of the houses where possible. Lectures on sanitation, personal hygiene and daily habits of the people will have to be occasionally given. If needed the drains might be made *pacca* by enlisting the sympathy and support of the people. A village welfare society could be conveniently organised. People of mature age will give the benefit of their purse and experience while the village youth will come forward to participate in the sacred work before us.

The education-board will have to prepare a statement showing family-wise the number of children—so many in school and so many yet outside, the number of adults—so many already in

the adult school and so many yet outside. They will have to see whether there is a village library in their ward. If not they will have to start one.

The co-operation group will be in charge of the financial condition of the people and will try to reduce the people's extravagance and start thrift and co-operation.

The cultivation or the agricultural group will be solely in charge of the agricultural aspect of the village. Their duty it will be to find out what improved agricultural implements are being used by the family, what sort of seed is being sown in the fields and what sort of cattle the villagers have. They will have to keep these people informed of the disadvantages and disabilities of their own making and will persuade the people to take to improved modes of life. Frequent talks on cattle, seed and crops and their diseases must be given to the people and suitable literature-pamphlets and newspapers supplied to the village library.

There will be two more groups or boards—one games-board and the other garden-board. Native games like kabaddi, wrestling, running, tug-of-war could be organised—the pupil-teachers and the villagers participating, conjointly or one against the other. Occasional competitions could be held and prizes given. The success of the games will depend of course on the enthusiasm and personal interest of the teaching staff of the training institutions, hence the necessity of giving first-class staff to the training schools, who could combine mental and physical efficiency.

The garden-board must consist of pupil-teachers with aesthetic taste and who have shown enthusiasm in this activity in their own school. They must clear sufficient space round the village-well or wells and convert the stinking swamps into a smiling garden. They have to go still further and should not rest till every family in their ward has got a small garden of its own.

Seasons of epidemics like malaria, cholera, small-pox, influenza, etc., will afford ample opportunities for doing this God's work and relieving human misery and saving the people. The health officer could be approached, the local dispensary utilised, funds collected and substantial relief afforded.

Training institutions enjoying the proud privilege of extensive lands are the most congenial places for starting dairies thus giving practical training to the would-be teachers in the breeding of strong and healthy cattle. But where this privilege is not enjoyed dairies could be organised on a co-operative basis.

The dramatic club of the school and the magic lantern could go a long way in breaking the barriers between the school and the village and shaking off the lethargy of the people.

The training course at present is so short and the programme so congested. The bugbear of examinations is ever haunting us like a ghost but I can say from experience that many a lesson could be taught in minutes when made the subject of practical work—lessons which would take hours and hours and would require the burning of midnight oil if attempted through books. Certainly the syllabus for training institutions must be simplified and undesirable technicalities eliminated.

If the present day teacher is pent up in his own school cell, he is not much to blame. The training institutions are responsible for turning out a lot of sulky teachers crushed under the weight of books and examinations. The teacher's mentality is to be changed. If this is done a new era of health and happiness will dawn upon the land and India will justly claim to be the brightest jewel in the British Crown. The new era has, in fact, already commenced and its light has travelled far and wide throughout this land of five rivers. The historian will certainly write in golden letters the name of Sir George Anderson and his colleagues who are carrying the torch of knowledge to the humblest home in the land. All thanks to God who has entrusted the destinies of the Punjab to a Governor like Sir Malcolm Hailey who has shown restless energy in developing the land and transforming it into a first-class country.

RURAL EDUCATION AND COMMUNITY WELFARE.

BY S. GOPAL SINGH, B. A.,

Assistant Registrar, Co-operative Societies, Gurgaon.

I wish to confine myself to what is being done in Gurgaon District to educate the rural people and to teach them to lead a better life.

Shows and Melas.—Shows and Melas are held at different places in the District. Those who have seen Palwal Show can imagine how much education these melas do give. Every department does its utmost to teach the people on such occasions.

The Agricultural Department shows different kinds of insects and their good and bad effects on different crops. The insect enemies and friends are made known to the farmers. Different varieties of seeds and effects of good as well as bad seed on the crop is shown. Demonstration in ploughing and other operations is done extensively. A ploughing competition is held. The agricultural show lasts throughout the day and one man takes the people by groups and explains the charts and insects. A good stock of different implements is kept at the show. Literature on agriculture is sold and posters and pamphlets are distributed free.

The Health Officer holds his own show. The show room remains open from morning till evening. It contains charts on epidemic and contagious diseases and the means of preventing them. Child welfare charts are also hung up. A man takes the people by groups and explains them to the people. Some literature is sold and some is distributed free.

A Co-operation Show is held. The maps showing the consolidation of holdings in different villages and posters on different subjects are hung up. Literature on Co-operation is sold. The people are taken in groups and the maps and posters are explained. Posters are distributed free.

The Veterinary Show is the biggest. The cows, the horses and other cattle are brought for show and sale. Races are held. Prizes are given for good breeds of cattle and to the winners in races. The people go round to see them.

Night Programme.—Magic lantern shows by different departments are given. These will be described later on in the description of Propaganda Carts.

Amateur Dramatic Club.—Instead of dramas which we see on the Lahore stages, we see on the A. D. Club stage scenes for rural uplift. Such dramas are staged which give practical education useful for an average man in his daily life, such as the advantages of dealing with a co-operative society, the folly of making "Uplas," advantages of digging manure pits, precautions to protect the people from diseases, and the advantages of good seed, good bulls, good cows, the iron plough and rahat.

Singing Parties.—In place of singing parties which sing improper songs at the melas we have got singing parties which sing songs about a co-operative society, a good bull, an iron plough, Uplas, bad customs which should be stopped and about the diseases which should be eradicated. For example I give a few verses of a song here. *Rasia* :—

رُت برکھا کی آئی ساجن ہو جائیو ہوشیار	رُت برکھا کی آئی ساجن ہو جائیو ہوشیار
چھاجوں چھاجوں مینہ برسایا	چھاجوں چھاجوں مینہ برسایا
ساجن ہو جائیو ہوشیار	ساجن ہو جائیو ہوشیار
دام جو مانگے دے کر آئیو	دام جو مانگے دے کر آئیو
ساجن ہو جائیو ہوشیار	ساجن ہو جائیو ہوشیار
دھرتی پر وہ ایسے جائے!	دھرتی پر وہ ایسے جائے!
ساجن ہو جائیو ہوشیار	ساجن ہو جائیو ہوشیار

Propaganda Work.—We have an outline of propaganda work for the use of lecturers, school masters, social workers, and all those officials or non-officials who are endeavouring to uplift the people of Gurgaon District, and to improve their condition of life. The main ideas embodied in the outlines are better living and better homes.

Propaganda Carts.—The District Board has organised a system of propaganda carts. The carts go from place to place in the rural area. They contain agricultural implements, specimens of good seed, charts of good as well as bad crops and charts for the health department, prepared by the Red Cross Society, and a magic lantern. During the day a show and demonstration are given. Literature on different subjects is sold and pamphlets and posters are distributed free. At night magic lantern slides are shown. They generally deal with health, a healthy child and sickly child, how to rear a child, the prevention of epidemic diseases such as cholera, plague, small-pox, etc. These slides are explained.

The slides of the Veterinary Department are also shown, a bull of good breed is shown along with a bad bull and the results of covering by both are explained. A good cow and a bad cow are shown and their cost and income are estimated and explained to the people. Co-operative slides are shown and co-operative methods are explained and compared with unorganised non-co-operative methods.

Rural School of Economics and Village Guides.—This school was started from 1st October 1925, for the training of teachers and patwaris for higher and better work in their villages. Heretofore these officials were merely teachers and patwaris in the strict sense of the word. It is now intended that they should become centres of village life, not only dealing with reading and writing, ordinary rules of arithmetic, and revenue papers, but with crops, diseases of animals, co-operation, land revenue, administration, first aid, public health, forestry, games, scouting, village hygiene and sanitation, counter-measures against epidemics, social uplift and so on.

Those who live amongst the villagers are the only people who can do this work properly and our teachers and patwaris are the best men of this type that we have. There were 46 students in the last class and there are 84 in the new class. The lectures are given by the Civil Surgeon, the Health Officer, the Veterinary Inspector, the district staff and the staff of the Co-operative Banks, the Forest Ranger, the Tehsildar, the Educational Inspecting staff of the district and others. Practical agricultural training is carried out by a specially selected Agricultural Assistant.

Village Guides.—The present state of affairs in the words of Mr. F. L. Brayne, I. C. S., Deputy Commissioner, Gurgaon, are, "Every one of the many departments working in the District has its men at District or Tehsil head-quarters. They shoot out into a village for an hour or two and back again. They are strangers in strange clothes and speak a strange language. The people dislike them and distrust them. If anyone is going to help the villager he must first gain his confidence, and to gain his confidence he must live in the village, speak the village language and wear the village clothes. At present this is not done and the various departmental officials do very little good in comparison with the amount of money spent on them. They spend their whole time in travelling and in writing diaries to justify themselves, and waste much Government time and money. They can never know the people or become their friends. They spend an hour or two in each village and are off again. One man comes to kill rats but if asked about a bank problem refers the questioner to some other department. Another man comes to see if the iron ploughs are all right but cannot tell them any thing about plague prevention. So it goes on, the villagers are worried by strangers whom they do not know and never can know."

To remove these defects we want to have a common staff for village work—one man to each zail, living in the zail, to do all the work of all the departments. He will be called a Village Guide. Eleven Village Guides are already posted. They will do the following work :—

1. All bank work (except audit).
2. Pest work—field rats, kutra moth, porcupines, etc.
3. Public Health Work—Ratting, compiling lists for vaccination, cleaning up villages by digging of manure pits, etc., inspection of birth and death registers, preparing the people for inoculation and vaccination.
4. Preaching with and without the magic lantern and demonstration cart, teaching agriculture, co-operation, hygiene, etc.
5. Agriculture—demonstration and sale of improved ploughs and other implements, improved seed, Persian wheels, Hissar bulls, flower seeds, etc.
6. Urge the people to send girls and boys to school, popularise marriage registers and inspect them.

A good guide will have a book for every village with a page for every family. He will fill in details from time to time, so that he will know which children are due for inoculations, how many are still kept away from school, what improved implements the man has, whether he sows good seed or bad, whether he keeps good cattle or bad, whether he is a member of a bank or not, and

every single detail that is required for the purpose of rural uplift.

Health Association and Domestic School of Economics.—The Gurgaon Health Association has adopted the following scheme of work and expansion. It may be treated in two parts. The first is the programme of village work and propaganda, the second the provision of facilities for training workers suitable to undertake propaganda in the villages. The village work is to be undertaken by Lady Health Visitors. It will be the Health Visitor's duty to enquire for and visit in their homes newly born babies and their mothers to advise the mothers on the feeding, clothing, and cleansing of their babies and themselves. She will also visit advanced pregnant women and advise them on necessary precautions and preparation and the selection of a good dai, etc. She will also give lectures to women on health topics, sanitation, etc., and lecture the village dais and train them at some hour of the day. She must be prepared too to attend labour cases if any dai needs her advice.

Dais' Class.—Gurgaon Health Visitors will have to train the dais and give lectures on such subjects as sanitation, domestic hygiene, child welfare, etc., in the school of Domestic Economics.

All Health Visitors will be required some evenings a week to give magic lantern lectures in the surrounding villages on Child Welfare and to explain the advantages of Health Centres and thus induce more villages to join the association. The dais' class mentioned just now will consist of dais who offer themselves for training from the whole District. They will learn not only midwifery but attend the health centre regularly and learn everything possible about the welfare and upbringing of children, so that they will be of very great value when they return to their villages.

School of Domestic Economy.—In order to spread elementary principles of health and hygiene in as many villages as possible and to uplift the people with the greatest possible speed, it is necessary to concentrate on improving the ideas of the women on these subjects rather than of the men. The women will pass the ideas on naturally to their children and will spread them far more than men can by their gossiping. The School of Domestic Economy proposes to train women to accomplish this pioneer and preliminary work. In its own sphere it does the work which the rural economics school does for the men. It takes female teachers and other candidates for a six months' course, trains them in cooking, sewing and knitting, first aid, health work, prevention of epidemics, sanitation, hygiene, infant welfare, etc., by means of lectures and practical work. When they pass out some of the pupils will be chosen as itinerant lecturers and will tour the District lecturing with the magic lantern on what they have learnt of the gospel of progress.

Panchayats.—Gurgaon District has Ahir, Jat, Brahman and Meo panchayats. A Gujar panchayat is being formed. The existing panchayats are doing excellent work in eradicating the present ideas of absurd expenditure on (1) Kaj and other such ceremonies, (2) Jewellery, (3) Wedding, (4) Litigation. In some villages the girls are going freely to village schools.

Cattle Breeding Association.—The Gurgaon Cattle Breeding Association is under formation and about 150 members have joined and paid the subscription.

Rural Community Council.—There is the Gurgaon Rural Community Council which guides all these institutions. A stall remains open in the district courts for the free distribution of pamphlets and for giving free information regarding all beneficent departments to the people.

It is difficult to describe in so short a time all the activities of all the associations which are doing excellent work for Rural Education and Community Welfare. The results are most encouraging. These schemes and associations are the creation of Mr. F. L. Brayne, I. C. S., Deputy Commissioner, Gurgaon, who takes keen interest in the welfare of his people.

MODERN RURAL CONDITIONS IN AMERICA.

BY REV. E. D. LUCAS, D.D., M.A., PH.D.,

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My knowledge of rural conditions in Europe is too meagre to allow me to say anything about conditions there, so I shall confine my remarks to America, and the part of America I have in mind for the most part is the north-eastern and north-central sections of the country.

Just one word about my experience of farm life in Europe. Summer before last we spent six weeks on a farmstead in Switzerland and I wish to make just a few passing remarks. The farmhouses and villages are well-built; stone, cement, wood and plaster have been freely, skilfully and harmoniously used to produce strong, attractive and nicely-furnished homes. The surroundings are kept clean and neat and the animals well-housed and groomed. The roads throughout Switzerland are magnificent and well kept and this in a mountain country is a gigantic task. Every advantage is taken of the forces of nature, the railways are run, the towns lighted, the lumber and grain mills furnished power, from hydro-electrical plants. The country farm people are well educated and are not ashamed to turn their hands to any honest task. A great many curious toys are carved from wood in the farm houses during the long winter months. The farmhouse

in which we stopped was the local post office, and Monsieur Anex and his grown up son spent an hour or two a day in attending to this work. Why couldn't farming and postal work be combined in many a village in the Punjab? The farmers grow a great variety of crops, vineyards clothe the lower hill-slopes, grain smiles in the bottom land, or if the soil is too heavy it is pasture for splendid herds of cattle, hay and potatoes grow on the higher slopes and fruit and nut trees are to be found everywhere, and bee-hives and poultry yards in the larger villages. But I must not linger in Europe. European country life is on a much higher and more intelligent standard of living than any that prevails anywhere in Asia, so far as I have seen it, and in the Panjab our conditions seem crude and barbarous compared to those of Europe.

In America rural life is very different from rural life either in India or Europe. In Europe and India land is scarce, in America men are scarce. In American farm life, everything is dominated by the scarcity and high price of labour. College boys can go to the wheat and corn fields of the Middle West at harvest time and earn from \$3 to \$6 per day with food and lodging.

American rural life has undergone a veritable revolution within the last forty years. Machinery, science, good roads, cheap and universal and rapid transportation, the enormous growth of city markets, these and allied forces are at the bottom of this revolution. Between September 1925 and August 1926 I saw hundreds, almost thousands of men of American country-side in motor cars on splendid roads where the railway will never go.

What are the most obvious things which impress one who has spent many years in the Panjab and knows its country-side fairly well?

Everywhere one sees for the most part well-built, comfortable looking farm buildings. The farmer's house is very often a two-storey wooden-frame building, well-painted and carefully groomed with nice grass lawns surrounding it and plenty of shade or fruit trees. But more striking than the farm-house are the 'barns' as the stables and outhouses in America are called. These barns are generally huge structures, part shed, part like a dwelling house. The barn houses all the live-stock of the farm, is a store-house of implements, seeds and fodder as well as a granary, and a store house for fruit, green and dried; there is often a repair shop and a tool room and an office in it. At one end very often a couple of huge silos arise.

Every farmer in America is of necessity a mechanic. He must be able not only to run machinery, but be able to do simple repairs and to substitute spare parts of which he keeps a plentiful supply.

The live-stock on an American farm are well-bred and well kept animals. The pigs we saw in New Jersey hardly seemed to

belong to the same genus of filthy animal seen in some of the Panjab villages. Cattle and horses are very carefully selected and those that don't pay for themselves make way for those that will. The ploughing is all done by very heavy draft horses or by motor tractor—3 horses constitute a plow team and they cover four or five times the area covered in the same time by a good pair of Panjab bullocks.

Every farm in America is a unit, a solid block of land, not scattered strips belonging to various owners. Every field is fenced and devoted to particular uses determined by the character of the soil, water and moisture conditions, etc. Irrigation in this entire area is unknown and drought hardly known, though damage is done by hail, early or late frosts, violent winds and pests. The farmer's work everywhere is the most hazardous, and the risks cannot be adequately foreseen and provided for as in other professions.

Within the last 20 years—the motor car era—good roads have been built all over America until now America has the best road system in the world. Some of these highways run straight across the Continent for over 3,000 miles and one can drive that distance without meeting a mud puddle or any obstruction to the smooth running of the car. These roads have penetrated every part of the country. The roads are built partly out of national, partly out of local funds; but once built their upkeep is left to the locality, and an intelligent community that has once known good roads will never return to bad ones. When one thinks that there are not more than 3,200 miles of good road in the Panjab and that such important centres as Lyallpur and Lahore are not connected directly by metalled road the contrast is striking.

Good roads and cheap transportation and the use of machinery have transformed farm life. There are more than 4,500,000 automobiles on the 6,500,000 farms of America, as against 500,000 tractors and 400,000 lorries. The farm-house, with telephone, radio, rural free delivery and the automobile, is no longer the isolated, lonely place it was a generation ago.

And lastly amongst these obvious things is the community or consolidated school; often the finest building in the entire neighbourhood. The consolidated school is made possible by the school bus gathering up and returning to their homes all the children of a widely scattered neighbourhood. These schools have trained teachers for each grade, furnish free text-books and are as well equipped and planned as the city schools. These schools are revolutionizing farm intelligence and farm manners.

Now let us look a little bit more carefully at three aspects of farming ;

1st, farming as the producing of goods, the raising of the level of production ;

2nd, the transportation, storage and marketing of farm produce ; and

3rd, the more human sides of farm life, the home, education, health, social and recreational life. politics and the farmer, and religion and the farmer.

Production on American farms has been revolutionized by machinery. Not only are the great primary operations of farming, such as plowing, reaping and threshing done by machinery but many others such as the milking of cows, churning, making butter and cheese, sawing of lumber, road-making, etc. One can travel through some of the richest farm-land in the busiest season and only see a few scores of men at work. The most expensive machinery is often purchased by a group of farmers and is used in rotation. This means that some of the dirtiest and most exhausting work of the farm no longer depends on human muscles. Hours of labour have been greatly shortened and the farmer has both time and energy for educational, social and political activities. He is no longer condemned to a life of hard labour and never-ending drudgery. The machine has also entered the farmer's home and lightened the household work of the women. Bread is generally bought from bakeries ; clothes ready made are purchased from the shop ; the vacuum cleaner, the washing machine, the electric iron, running water and electricity and gas for cooking, lighting and heating have revolutionised the home life.

In a 10-hour day it is possible for a man using 3 heavy draft horses and a 14-inch bottom walking plough to turn over 2.3 acres. In the same length day one man operating a 25-30 H. P. engine drawing eight 14-inch ploughs can turn over an average of 16 acres. With the old-fashioned cradle one man cut 2 acres of wheat in a day. With an 8-ft. cutting and binding machine and 4 horses one man can cut an average of 18 acres a day. It is not uncommon for a tractor pulling gang plows, harrows and seeders to prepare and seed from 80 to 100 acres in a day. A farmer on an average 150 acre-farm in the Middle West practising the following rotation of crops, maize, oats or wheat, clover and timothy grass, and a root crop must have the following list of machines :—Tractor or teams ; plows for tractor or teams ; harrow-disk, spring-tooth or spike ; grain seeder ; corn ; beet, cabbage or celery planter ; cultivators ; mower ; hayrake ; hay-loader, harvester ; grain-binder or header ; corn binder ; wagons ; fork and derrick for handling hay and clover ; manure spreader ; spraying or dusting outfit for fruit and vegetables ; hand tools, ashoes, shovels, rakes, hay forks, etc. And these are but the major tools.

Great advance has been made in determining the best crops to grow in any given area. In rotation of crops, in methods of fertilizing, in selection of seed and in getting new varieties that either have a greater yield or have greater resistance to drought or to pests; in the improvement of breeds of cattle and other live stock; in all these lines marked progress has been made. There is room of course for much greater progress in all these lines.

The control of insects and other pests and diseases which affect both plant and animal crops has become a matter of very serious study and much progress is recorded. It is estimated that 10% of the total crop value is lost through pests and diseases. The boll weevil destroys \$200,000,000 worth of growing cotton each year and rodents destroy \$500,000,000 in crops and on the ranges.

The San Jose scale nearly wiped out the citrus fruit industry in S. California, and was not conquered until the Australian lady-bird, a small red beetle, was shipped in and increased to such an extent as to combat the scale. Insect life exists on a system of checks and balances. The corn borer was playing havoc with the maize crop a few years ago. Its natural enemy was finally found in the shape of a minute parasite in S. France. An eradication campaign against rodents by 1920 had covered 18,000,000 acres, 1610 tons of poisoned grain had been distributed which required 4 tons of strychnine to prepare.

Improvement has been made in the type of building. An illustration may be taken from a better type modern dairy barn. Concrete walls and cork brick floors, steel stanchions, piped water running into individual troughs for each cow, overhead carriers for food, bedding and manure, electric lights and electric milkers—this is the accepted and widely installed standard type.

With all of the American farmers' intense individualism and self-reliance there has been a great extension of co-operative effort which has spread successfully into many spheres. Co-operative associations for marketing, joint ownership of expensive machinery, co-operative creameries, cheese factories, bacon factories, cotton gins, canning factories; co-operative warehouses: co-operation in securing better schools and community social centres and many other joint efforts have raised not only the level of production but the whole plane of living on the farm.

But increased production alone is not enough—indeed increased production may defeat its own ends. It may lead to such a fall of prices as to destroy all profits and eat into the cost of production. We have a case of that to-day in the over-production of cotton and the great fall of price which has hit the Southern farmer very hard. The individual farmer must make a profit on his farm, he must sell at advantage or go out of business, in American conditions of to-day.

The first phase of the problem is that of transportation, carrying his produce from the farm to the best local market by team or motor lorry. The coming of good roads and of the motor lorry has meant very much the same thing to the isolated farm as the coming of the railroad to the plains of the Middle West. The lorry allows him to get to a distant market and back to his work in a minimum of time.

Better transportation is a vital problem when we consider that 6 per cent. of the value of produce on the average is absorbed in the haul to the local or long distance market. Reduction of local costs depends upon good roads for all the year use, upon more rapid methods of getting to market and back and upon greater capacity of wagons or lorries. Groups of farmers in a given locality are uniting in a collecting system whereby one of their number, or some one employed by them, daily or at stated intervals takes community produce to the local market. This is done widely in the handling of milk and cream. When dealing with railway haulage the large co-operatives have employed the best experts available as in the long run it increases the profits to the individual farmer where his goods are transported cheaply and sold in the best market.

If railway charges alone are considered, then the burden of transportation charges on farm produce become much heavier. Farm prices in such cases are prices at terminal markets, less freight rates, farm to terminal. An examination of 9,476 freight cars on trains of fruits and vegetables in 1920-21 showed that the average freight deduction was 32 per cent of the wholesale price at the terminal market. Similar surveys of other products showed that freight equalled 14 to 45 per cent. of the farm price of maize, 8 to 18 per cent. of the farm price of wheat, and 3 to 12 per cent. of the farm price of cotton. Freight means a cost item amounting to from 1/10 to 1/3 of the value of most farm products and any cheapening of these costs will be of immense help to the farmer.

Prices of things the farmer buys are governed by the price at wholesale market plus freight to farm. In 1921 as much as 15½ per cent. of the price charged for implements represented freight charges. If prices for farm products are low and freight charges are high an intolerable burden is placed on the farmer.

The bulk of farmers in America are convinced that the marketing of their products is wasteful and exploitative. According to the farmer's point of view this is what happens:--

It takes 3½ maunds of wheat to make a barrel of flour. When the wheat-grower was getting \$8.37 for the wheat, the miller got \$12.50 for the flour, the baker \$58.70 for the bread, and the hotel-keeper selling the bread in slices in Washington received \$587. A mutton chop in New York hotel cost more than was

paid for a sheep in Colorado or Kansas. The farmer usually gets for his stuff about 30 per cent. of the price paid by the consumer. The farm value of crops in 1922, deducting value of all animal products, cotton and tobacco was estimated at \$7,500,000,000, for these products in final form consumers paid \$22,500,000,000; 15 billion represents the cost of manufacture and distribution. There are more than 4 million food manufacturers and dealers in the United States as compared with 6,500,000 farms. Each farm must support besides itself $\frac{1}{3}$ of a food dealer, middle-man or food manufacturer. To combat the wastes and high cost of marketing various measures have been proposed. Co-operative marketing has made considerable progress in the field of all products where grading, packing, sorting and shipping play a large part in the marketing. The California fruit-growers association has been one of the most successful concerns in this field. A study of these huge co-operatives reveals but one aim—marketing their commodity in such a way as to ensure a maximum return to producer. Many producers of some commodity, such as cotton, eggs, fruits or wheat in a given region are organized into a marketing co-operation. Each member contracts to market all the product he raises through this corporation. Warehouses are built. Experts in grading and marketing are employed and the farmer has only to deliver his crop to his local warehouse or grading establishment and receive a warehouse receipt for it. He also agrees to raise a product of a definite type. For example, when the egg-raisers of California decided to attempt the capture of the white-egg market of New York, each farmer agreed to keep only white Leghorn hens. By this method a standard type was obtained but it did not obviate the need for careful grading. These organizations have reached their present high state of efficiency only through painful ups and downs. At present they have some of the best marketing experts in the country on their staffs and do not hesitate to pay high salaries. The New York Dairymen's League Co-operative Association has 70,000 members and does a business of \$70,000,000 annually.

In a small and thickly populated state like New Jersey where the farms are comparatively small and there is much diversified farming an interesting development of the marketing problem has arisen. Along the main arteries of motor traffic hundreds of farms display on stands bordering the road such farm produce as baskets of apples, of potatoes, jars of cider, bunches of vegetables, baskets of berries, grapes and other fruit in season. There was a farm about five miles outside Princeton on the main highway to New York from which we bought baskets of apples, jars of cider and other fruit in season at rate 5 to 10 per cent. lower than the Princeton shops offered. Also many of these farms have set up booths in which soft drinks and light refreshments are sold and often a petrol refill station is attached. So has commerce and the market invaded the country life of some areas of America.

The farmer is no longer the country jake, the hayseed, the lout or bumpkin which he often was and oftener was called, a generation ago. Great headway has been made with these problems of marketing, transportation and storage but still more remains to be done before anywhere near the same level of efficiency has been reached, as that attained by the factory in the distribution of its product.

Before considering the change in rural culture, the improvements on the more human side of farm life, let us glance at what one writer has called the balance in farm relations. He says "the prosperity of agriculture rests upon a delicate balance between those who live on the farms and those who live in the cities. It rests upon a delicate balance between transportation, manufacture, commerce, and agriculture itself. This sensitive equilibrium of the great industries may be considered under five heads :—

1. Balance of farm income with the general income.
2. The balance of farm accumulation of wealth with general accumulation of wealth.
3. The balance of population between agriculture and industry.
4. The balance of production between agriculture and industry.
5. The balance of farm prices with other prices.

The central problem of the farm is how to maintain a balance with all other phases of economic activity to the end that mutual interdependence of the farm and other industry may result in mutual prosperity."

Let us hastily examine these five balances. First the balance of farm income. The farmer's share of income materially increased from 1889 to 1919 but then underwent a sharp decline from which it has only partially recovered as yet. Agriculture has produced from 14 to 23 per cent. of the national income depending on the harvest and world demand, normally 17 or 18 per cent. and yet more than 26 per cent. of people gainfully employed are engaged in agriculture. During the most favourable period the average *per capita* income on the farm has been only a little more than $\frac{1}{2}$ of those engaged in the other major industries. In 1918—a good farm year—the average *per capita* farm income was \$359 as contrasted with \$677 for the non-farm population. In 1920, a bad farm year, the *per capita* farm income was \$244 and non-farm was \$838. In 1913 it was found that if the average farmer had gone to work as a labourer his average labour income would have been \$444 instead of \$328 as it was. If he had worked as a miner he would have \$755. One caution must be thrown out in the use of these averages. They are pulled down

by the abnormally low incomes of croppers, negroes and poor labour on Southern farms. In the Middle West the average is much higher.

The second balance is the Wealth on the farm compared to the non-farm population. In 1920 it was estimated that the *per capita* net worth of the farming class was \$1,978 as compared with a *per capita* net worth of \$3,175 for non-farming classes. Land values make up 70 per cent. of this total and the average landlord is either a retired or active farmer. Some of this land value is due to increased productivity but much of it is due to inflation of currency and unduly high prices of farm produce in the war. High land values tend to produce a class of permanent tenants and to introduce an element of aristocracy in American farm life that is new to it. Heretofore a landless farm labourer on the average spent ten years as a hired man, 10 years as a renter and 10 years as a partial or complete owner of the 30 years of active farming life.

The third balance is of population. The balance of population that is right at one stage of economic organization is wrong at another. The proportion must change from time to time in order to make adjustment to new conditions of production, new inventions, new standards of living. The population of the United States increased from 75 millions in 1900 to 105 millions in 1920. Farm population remained almost stationary. Those gainfully employed in agriculture over 10 years of age rose from 10,248,935 in 1900 to 10,682,944 in 1920. The increase of city population in these 20 years was 60 per cent. and for farm four per cent. Taking 1900 as the base year with an index figure of 100, the number of persons engaged in leading forms of production in 1920 is shown by the following indexes :—

Agriculture	...	104
Manufactures	...	208
Mines	..	170
Railroads	..	199

In 1900 it required 40 per cent. of the population to feed the whole, now it requires only 30 per cent. The growing efficiency of the farmer, the increased use of machinery, improvements in transportation and marketing have enabled him to feed the whole. Over-population or under-population on the farms has to be judged from the point of view of economic life ; not from any preconceived notions of the virtues of city or rural life, but between the balance struck between consumers and producers in the economic markets where the outputs of farm and factory

are exchanged. The present problem is to keep people off the farms so that there will be no over-production of farm supplies.

In England less than 1/10th of the population works in the farms; in France more than 2/5th; in Germany more than 1/3rd, in India more than 70 per cent. The United States seems to be tending towards a population distribution like England. From the point of view of morals, health and the long future it is more than questionable whether the French and German distribution is not much the best.

The fourth balance is that of production. Although farm population has increased very slowly the physical volume of production has increased immensely.

If 1879 is taken as a base line for population and for physical volume of production of agriculture and is represented by 100 index number, then in 1922 population would be represented by 221.4 and physical volume of production by 236.4. The balance of production between agriculture and other major industries taken as a percentage of increase in 1920 in relation to 1900 may be analysed as follows:—

In 1920 as compared to 1900 there were for

		Persons.	Production.	Relative output per person.
Agriculture	..	104	138	133
Manufacture	..	208	228	110
Mines	..	170	231	136
Railroads	..	199	234	147

The productive capacity of the average farmer has increased fully 1/3rd in the last 2 decades. The output of food in 1920 for 105 millions was as much as it was in 1900 for 75 millions and the output of non-agricultural 60 per cent. greater. The Belgian farmer puts 5 times as much labour per acre—he cultivates 5 acres per man as compared with 26 acres per man in the United States but he gets only twice as much in produce.

The fifth balance is the balance of farm prices with other prices. This ratio is the purchasing power of the farmer's dollar. If 1913 is taken as the base year and the purchasing power of farm products given an index value of 100 for that year, the

fluctuations in the intervening years in the purchasing power of the farmer's dollar is marked thus :—

1913	..	100
1914	..	112
1915	..	106
1916	..	89
1917	..	106
1918	..	112
1919	..	111
1920	..	86
1921	..	67
1922	..	69
1923	..	72
1924	..	87

This total shows the great fluctuations in the purchasing power of the farmer's dollars much greater than in any other major industry. How to stabilize prices for farm produce is a problem for which no adequate solution is in sight. It necessitates extreme caution and thrift on the part of the farmer if he is to make a success of his business.

Let us glance briefly at three other problems and then summarize our conclusions. Land ownership is a vital question to agriculture. Landlordism has been successful in very few places and in still fewer eras of human history. Percentage of total farm area rented and operated in various countries is given in table below :—

Country.		Year of Census.	Per cent. of rented area to total farm area.
England	..	1914	88.9
Denmark	..	1918	7.3
Belgium	..	1910	54.2
France	..	1892	47.2
Germany	..	1907	12.7
Japan	..	1917	46.1
United States	..	1920	37

Tenancy is not intrinsically bad or good. Tenantry is very prevalent in the Southern States where plantation owners or managers give much personal attention to tenant labour.

The heart of the problem in United States is how to enable the tenant to acquire gradually the ownership of his land. Where the tenant is a person of proper ability and intelligence, the determination to buy the land whereon he works acts as an

incentive to conserving the fertility of the soil, to making needed improvements, to steadiness and stability in operation, to better technical methods of farming and increased production. In such a democracy as America there is every reason to prevent the growth of hereditary classes of landed aristocracy and landless peasants side by side. To help the tenant it is necessary to prevent speculative rising and falling of land values ; proper facilities for farm credits and farm mortgages at low rates of interest ; long term leases of land making for permanency ; sharing of land-owner in costs of improvements.

Another problem is taxation. In 1922 the farmers paid in taxes \$1,436,000,000 and all others \$5,625,000,000. The ratio of taxes to income is given thus :—

		Farm taxes to farm incomes.	Other taxes to other income.
1913	..	10·6	5·5
1919	..	8·3	13·2
1921	..	17·2	16·6
1922	..	14·3	11·6

A large part of farmer's taxes are paid to local bodies and are returned to them in roads and education. The great problem is better to adjust taxation to the fluctuations of farm income.

The last problem is agricultural credit. As agriculture has come more and more under the regime of business and a money economy the importance of ample credit facilities has been impressed upon the minds of all concerned with farms. Most farms are bought on long-term loans with mortgage security. Most farms are financed during harvesting and planting seasons by short term loans from banks.

Agriculture has two primary interests in finance. One is to secure adequate loans on favourable terms and the other is banking administration which will maintain reasonably steady prices and avoid inflation and deflation of the currency.

An elaborate federal structure of credit has been built up in recent years. Federal reserve banks are authorized to rediscount agricultural paper having 9 months to run, rediscountable commercial paper can run only 3 months. National Agricultural Credit Associations have been created which provide credit from 6 months to 3 years. Rural banks are given more lenient capital requirements in joining the Federal Reserve system than city banks. As members they are given ample credit facilities.

Long term loans are facilitated by two devices. National Banks are permitted to extend 5-year loans on sound farm mortgage security. Special institutions, such as Federal land banks, have been created to provide mortgage loans running from 5 to 36 years.

Almost of equal importance to the actual supply of credit is the control over all credit maintained by the Federal Reserve Banking system and the definite attempt to prevent violent fluctuation of prices—steadiness of prices with moderate prosperity is the goal to be sought.

In conclusion one can say that farming as other phases of life in America has undergone revolutionary changes. On the whole there has been great improvement in many lines. Hours of labour have been shortened, drudgery and extreme fatigue have been considerably relieved both on the land and in the farm house by machinery, the isolation of the farm has been broken down by good roads, by the motor car, telephone, rural mail delivery, radio, etc.; the educational standards of rural schools have been raised by consolidated schools with trained teachers and all modern equipment; the social life has been brightened and improved by community centres; hospitals and medical attention is within reach of all but the most isolated farms; from the farms flows into the general stream of American life some of its most vigorous and intelligent and morally purposeful element. The American farmer is self-conscious and alert.

And if I may be pardoned for making one application to life in the Panjab it would be to say that there is a disastrous divorce between city and country here. The rural section of our people need every stimulus and help that they can receive from a more advanced and favoured city population. The road to progress is thorny and difficult at best but where there are cleavages in society which divorce intelligence in the city and labour on land, progress is not only difficult but practically impossible. Happily the very inclusion of this rural education section in this Provincial Education Conference is in itself the harbinger of a better day.

*Resolutions of the Rural Section, Punjab Educational Conference,
Lahore, 1926.*

1. Resolved that the important and selected papers read in the Conference be published in a book form as scattered publication in the different numbers of a journal is not so useful for ready reference. Also resolved that this publication be published in the Vernacular as well.

2. Resolved that each district community council be supplied with a gramophone, that a selection of good records be made by the Provincial Rural Board which should take steps to get records prepared on health, temperance, advantages of co-operation,

selections from religious books, poems by modern and other popular poets.

3. Resolved that existing melas, or fairs be made use of, and where such melas do not exist, that agricultural shows be instituted for carrying on rural community activities as instruction in co-operation, improved agriculture method, hygiene and village games, etc.

4. Resolved that the Rural Community Board, Lahore, may be requested to start an organ of their own for propaganda work among rural people and which would publish information about the salient features of the activities of the various district rural councils.

5. Resolved that the Project system of teaching should be tried on a wider scale in order to associate our teaching with the actual conditions of life.

6. Resolved that the curriculum and the methods of examination in the Normal Schools need revision and the Inspector of Training Institutions may be requested to take this work in hand.

7. Resolved that in all rural schools a suitable day be fixed each year for planting trees, hedges, etc., in the school compound and along public roads and that this day to be called "Arbor Day," be made a ceremonious occasion for the purpose of stimulating interest in tree planting, etc.

8. Resolved that the Conference thanks the Government and the various departments that are working for rural reconstruction and uplift and to further this cause rural institutions like that of Moga, Gurgaon and Gakhar, etc., may be given special grants by the Government for carrying on experiments.

9. Resolved that in view of the excellent work being done by the School of Rural Economics at Gurgaon, more liberal grants be sanctioned by the Government to enable that institution to carry on its work on a larger scale. Also resolved that the Rural Provincial Board, Lahore, be requested to assist financially and watch this experiment so that similar institutions may be opened in other districts.

10. Resolved that for the purposes of selecting candidates for Training Institutions and workers for rural work the term agriculturists should be made wide enough to include all those who have sympathy and aptitude for the work.

THE PROJECT METHOD FOR VILLAGE CHILDREN.

BY MISS M. J. R. MACDONALD.

The Project Method has gone so far as to get itself very much talked about. I understand that in the country from which its slogan was first sounded and in its birthplace, I refer to Teachers' College, Columbia University, they now lecture away to teachers about how to teach; but that they have become so self-conscious about the name "Project Method" that they will only say, "This and this are in accord with the *Project Idea*" when they have to refer to the method.

Perhaps we too are a bit tired of hearing 'Project Method! Project Method!' wherever we turn. It has assumed one of the characteristics of a virtue "much talked of; little practised." That is, they say so. But in reality I believe that every teacher uses this method to some extent and that all good teachers use it consciously or unconsciously all the time.

I presume it would not be presumptuous of me, even in the presence of so many of my distinguished fellow teachers to give a little explanation of what I understand to be the simplest underlying principle of this method. For myself I like the word *Purpose* better than *Project* perhaps because that was the word that first gave me the key to the outer portico of this palace of learning, where I am still standing.

Let the Purpose of the child guide the teacher. This is an upside down method surely, according to all our old ideas when the Divine Right of Kings was not more unquestioned than the right and duty of the teacher to guide the child. But if we examine it we will find that things have not changed so very much. The teacher is still guiding the child; but building on the purposes of the child. For instance:

A little girl wishes to make her doll a dress. There are scraps of material in the house. But for purposes of education, we might give the child a few pice and let her go to the shop and get a quarter of a yard of material. She has need of an Arithmetic lesson at once. She needs to find out how long a quarter of a yard is. At once the yard stick with its inches, or the foot rule—better the yard stick in this case, comes into her experience. Nine inches is the number she will be working with. If she has not learned before to count up to nine, this is a situation in which it could profitably be taught to her. Next she goes to the shop and chooses her cloth. A small money transaction comes in. Probably she will not have to count above nine for that. But, at any rate, it is a second Arithmetic lesson with

tangible things like coins that she can see and feel. An Arithmetic lesson related to her life. She comes back with her bit of material. What is it made of? Here is an opportunity for a Nature Study lesson which a wise teacher can adapt to the experience of the child. If one has a cocoon or a cotton bol or a bit of raw wool to show at the same time, so much the better. Of course, if it is a village school you may be able to show the child a sheep or a cotton field and these things will be part of her environment, so your task is made easier. She may even know something about silk-worms. This is where I think the village child has a long pull over the city child. Where did the material grow? Here is opportunity for a Geography lesson. In what sort of countries do we find wool-silk-cotton?

Next we come to cutting the dress. The child has several pictures or models to choose from. She has to decide, or ought to be allowed to decide for power of decision is one thing that it is very necessary to give the child an opportunity to develop. A lesson in form follows—a drawing lesson might be worked in here. There is also a lot of measuring and calculating to be done. This gives more opportunity for Arithmetic. There is much to be noted down—an opportunity for a writing lesson. Finally the doll's dress is completed in a series of sewing lessons. The whole process with amounts of material and expense and a drawing of the complete garment is written up and put in the child's project book and a copy of it in the school Project Book, which is kept in the library for future reference.

But you will say what about this method for Village Children? Is it a method that we can work in the villages? After all the village child is just a child whom the accident of birth placed in a village. If the Project Method can be used with children at all successfully, it can be so used with village children.

I speak as a missionary, speaking of our own Mission Area. I would say that the village child is particularly fortunate in that his education was in the experimental stage when we began to learn about this method. This is, no doubt, true of other Mission areas as well. It was, therefore, easy to introduce new ideas and new methods. Moreover the village environment and country life in general are so full of life situations that lend themselves naturally to this method that again the village child is particularly fortunate. For instance, there is a village not far from here where it was decided to open a school. There was some

land. It was a boarding school, and it was decided to grow as much of the school food on the land as possible and at the same time, to use all the activities connected with this self-help as projects in the school. The first practical difficulty that faced the management was that there was no house for the Agricultural Master to live in. He was living in another place. This took him away soon after the close of school and he did not arrive until after the garden hour was over in the morning. Thus the children got very little help from him and he was not in touch with the practical side of their work. After a few weeks, they sent their Panchayat to the Principal to ask if they might use 5,000 bricks that were lying piled up, waiting to be used in a granary. When asked why they wanted the bricks they said they wished to build the master a house. The Principal thought, "well if they do not build a house that any one can live in, at least, it might do to store grain in and that is what the bricks are for," so she agreed. She, herself, took the tape line and went out with them and with a bucket of lime, the 100-yard tape and six pegs they laid down on the ground one of their earliest Arithmetic lessons. It took three months to build the house. The little children carried and handed up the bricks two and three at a time, according to the size of the child. They kept count of their number of bricks and thus learned both counting and adding. There was no lack of Arithmetic reading and writing connected with this house for all the classes throughout. The children learned the points of the compass and how to draw a plan for a simple house from it. It had not been their first building project. The Christmas before they had built the Inn in Bethlehem and put in mangers and made little mud models of all the animals. So it was not brand new to them. A carpenter had to be hired for the doors and windows and the timber for the roof. But the children placed the timbers on the roof and wove the sirki for it out of sarkanda, which grows plentifully all around the place. They put the earth on and lepped it and it was the only roof in the school that did not leak during the first rains. It has now been lived in for three years and is still a very satisfactory house. It is a principle of learning that "what we do with success and satisfaction we tend to repeat." These children now suggest at once that they build a house whenever they see there is one needed. But they did not wish to do any building for over a year after their first house. The Principal was afraid that they had been fed up on building projects for ever; but it proved not to be so.

A pair of donkeys is kept at the school for the purpose of teaching kindness to animals. No animal in the world is so generally ill used as the donkey and none responds better to kindness and care. Two boys are responsible for the entire care of these two and this year there just did not seem to be a corner anywhere under cover to put them when the cold weather came. This fact was troubling the one in charge very much; but she had not talked it over with the children. One evening, going the

round of the school she found a large well-made piece of thatch lying on the ground and asked what it was for. One of the boys answered at once that it was a roof for the donkey's house. "Why did you make it so large?" said the Principal. "Because we had one last year and we noticed that the donkeys ate the walls. This year we decided that we must make it large enough so that when they are tied in the middle of it they cannot touch the walls. We noted how they stand when they are tied to their peg at night and decided that they take up six feet of space each way, given enough freedom to be comfortable. We decided that we needed a house for them twelve feet square, if it is made of thatch." One boy was thirteen and the other was ten. They have learned to see a need and to make plans to meet it and to act with a degree of judgment which would do credit to many grown people.

There is another school in this district, a village day school, taught by a man who has had a little training along Project lines. But he, as a boy, no doubt, in fact I know he had all his education by the traditional method. Here I would urge the importance, not only of training school to train teachers in the use of Project ideas but also, and most strongly, beginning with children in the Infant Class to educate them along Project lines. This school, which I was talking about before I digressed, had a nice, new building, a bit of land for a garden and a superintendent in full sympathy with any progressive methods the teacher might try to use. He began with the story method of reading but used it like the ordinary Qaida almost. Even his class in reading did not progress and everything else was taught frankly by the old method, showing that the method by which he was taught for years in school took a deeper hold than the short time he had in the training school. His garden was a thrifty plot of weeds, if ever there was one. The attendance was so low that the Inspector threatened at every visit to cut off the grant-in-aid. In short the teacher and school were so dead that a decent burial seemed to be the next thing indicated. Before the funeral could be carried out, however a new Mission District Inspector came, Mr. Marshall, whom many of you, no doubt, know. He was keen on the new method and I do not know how he breathed life into the dry bones but he did and the first thing we knew we were being asked to photograph Zam Zamma because the boys of this school were studying its history and writing it up in their Project-book and they wanted a picture of it to illustrate it. They wrote letters to Moga and told the boys of the same classes there what they had learnt about Zam Zamma and from that time on the school and the teacher became wide awake. Now they are all keen as mustard and the numbers have almost trebled, with more boys coming in every day. Just yesterday the manager told me that as she and the Inspector were going along the road to this school they passed a beautiful orange orchard and she remarked "What an opportunity for an orange project." The Inspector,

on arriving at the school tried to lead up tactfully to this idea with the teacher, when he found that both teacher and pupils were up on oranges and able to tell him all about the orchards and how long it took the trees to grow and how they are grafted, in fact every thing about them.

I might add many more illustrations of the actual working out of Project ideas in village schools. For instance, six or seven schools in the Sheikhpura District have taken the study of the camel as a Project and have found in it a wealth of material for reading, writing, arithmetic, and geography of which even their teachers have never dreamed. It has opened up a new world and made the camel an absolutely different animal to all of those children.

But I am sure I have taxed your patience long enough and I also feel sure that with an audience such as this, one need not make a long plea to insure any new method a fair trial. So I conclude thanking you very much for your gracious attention.

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COMPULSORY EDUCATION.

BY REV. F. B. LLEWELLYN, M. TH.,

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We do not want compulsory education. The old maxim "You can lead a horse to water but you cannot make him drink" is true in education as well as in life. It may sound reactionary on my part to be assigned the above subject and to begin my paper with the above statement. Well, I go further; I maintain that I should be the most reactionary antiquated, unreasonable person in this Conference if I did not believe that compulsory education was not only unjust, uneconomical, and undesirable but also impracticable and inefficient, if not impossible. I repeat we do not want compulsory education, we have had enough of it in our schools.

"Reading and writing and arithmetic,
Taught to the tune of a hickory stick."

Let us change the term compulsory education to compulsory attendance in primary schools. The compulsion is not upon the child but upon those who would cheat the child out of his birth-right of an education, the privilege of a childhood, the blessings of a period of play and learning, the opportunity of a normal development fitting for fuller life and an enlightened society. The legislation required is not against the child but on behalf of the child against his enemies. Statutory compulsion is justified against every parent or guardian or employer of a child of the school-going age who would keep that child—boy or girl—out of school

either because of ignorance, indifference, prejudice, or selfishness. The purpose of law is to protect the innocent, the weak, the unfortunate.

There should be no doubt on this point that the state has the right, moreover, it is the duty of the state, in the interest of the state as a whole and in the interest of the individual members of the state first to provide suitable school training for all children between the ages of, say, six and fourteen years, and second to guarantee that every child, boy or girl, is not hindered by any person or preventable circumstance from securing that training. We call this compulsory attendance, not compulsory education.

We shall treat our subject under the following heads: (1) Growth of compulsory attendance, (2) Difficulties in enforcing compulsory attendance in the rural areas of India, and (3) Some of the advantages to be gained under compulsory attendance.

I. Growth of Compulsory Attendance.

The experiment of compulsory attendance was tried in Germany in 1763 under Frederick the Great. In his *General School Regulations*, school attendance was made compulsory, adequate training and compensation for teachers were provided, proper text-books arranged for methods, improved supervision secured, and religious toleration proclaimed. (Monroe: *History of Education*, page 730). As early as 1794, all public schools and educational institutions were declared state institutions. It is possible that the high standard of efficiency in the Germany schools has been attained because the administration of an effective compulsory school law has been almost automatically operative in Germany for over a century.

England attained a rather high degree of efficiency in her schools under the voluntary system. The state began to help and encourage private schools in 1833 by the "grant-in-aid" plan. By the Act of 1870, the first elementary school was organised, supported and supervised by the state.¹ Under this same Act compulsion might be optionally applied by district school boards. In 1880 compulsory attendance of children under ten years of age was provided and in 1899, the age was raised to twelve years. In 1900, local boards were permitted to raise the age limit to fourteen years.

France.—At the opening of the French Revolution one-half of the men and three-fourths of the women of France could not sign their names. Revolutionary sentiment was in favour of universal compulsory free education but nothing was done. In 1806, the University of France was organised but primary education continued entirely in the control of religious bodies. In 1833, public elementary education was established and free tuition provided for those unable to pay. In 1881, primary education was made free and in 1882, attendance in primary schools was made compulsory.

United States of America. The state very early in the history of America assumed responsibility for education. A pamphlet printed in London in 1643 states,

“After God had carried us safe to New England,
And we had builded our houses,
Provided necessities for our livelihood
Had convenient places for God's worship,
And settled the civil government,
One of the next things we longed for
And looked after was to advance learning
And perpetuate it to prosperity
Dreading to leave an illiterate ministry
To the Churches when our present ministers
Shall lie in the dust.”

The first efforts were voluntary but it was soon evident that under the hard pioneer conditions and the suffering which ensued many parents and masters of apprentices apparently proved neglectful of their educational duties. Hence in 1642, the Massachusetts Law was passed which directed officials of each town to ascertain from time to time if parents and masters were attending to their educational duties, if all children were being trained “in learning and labour and other employments profitable to the Commonwealth” and if children were being taught to read and understand the principles of religion and the capital laws of the country. This law of 1642 is remarkable in that for the first time in the English speaking world a legislative body ordered that all children should be taught to read. (See Cubberley: *Public Education in U. S. A.*, page 17). This law, like our present Punjab Act of 1919, did not however establish schools and provide school masters. After five years of experience, in 1647 a further step was taken and a law passed providing

(a) That every town having fifty householders should at once appoint a teacher of reading and writing and provide for his wages in such manner as the town might determine and

(b) That every town having one hundred householders must provide a Latin school to fit youths for the university under a fine of £5 for failure to do so.

Mr. Cubberley quotes Mr. Martin, a historian of the Massachusetts public school system, on the fundamental principles underlying this legislation.

(1) The universal education of youth is essential to the well-being of the state.

(2) The obligation to furnish this education rests primarily upon the parent.

(3) The state has a right to enforce this obligation.

(4) The state may fix a standard which shall determine the kind of education and minimum amount.

(5) Public money raised by taxation may be used to provide such education as the state requires. This tax may be general though school attendance is not.

(6) Education higher than the rudiments may be supplied by the state and opportunity must be given at public expenses for youths who wish to be fitted for the university.

It is to be noted that the idea underlying all this legislation was neither paternalistic nor socialistic. The child is to be educated not to advance his personal interests but because the state will suffer if he is not educated.

These early laws fell into disuse and it was not until 1852 that America had the first modern compulsory attendance law. It required all children between the ages of eight and fourteen years to attend school twelve weeks a year, six weeks of which must be consecutive. This principle has now spread throughout all the states and compulsion is now accepted as a matter of course even in very backward communities. Particularly during the last twenty-five years much progress in education has been made. There has been general revision of the compulsory attendance laws; labour of young children has been restricted; work in certain industries has been prohibited; compulsory attendance applies to the whole school year; poverty of dependent parents no longer serves as an excuse for non-attendance; school censuses have been improved; special officers are appointed to enforce compulsory attendance and child labour laws; these officers frequently are women; a close study of retardation of children in school has been made because of its bearing on truancy and delinquency. Direct taxation of citizens has been used to finance the public school system extending from the primary through the university standard.

As an illustration of how taxation replaces tuition fees, I quote my own experience which is typical of the average American. I enjoyed about eighteen years of educational training without paying any tuition fees as follows—ten years in the public elementary and high school, two and-a-half years in the state normal training school, four years in the University and one year in the graduate college of the University. The cost of my education was provided for by direct taxation of all citizens of over twenty-one years of age. My father along with other citizens paid a small amount in annual school taxes from the time he was twenty-one years old and will continue to do so as long as he lives and had I myself continued in America as most of the recipients of this training do, I should now have been paying this school tax in return for my own education and in the hope of providing educational facilities for my children. Thus, tuition fees paid in the form of taxes are therefore reduced to a minimum annual outlay because they extend over a lifetime and because they are paid universally by all whether they have children in school or not. It is *co-operation* enforced by the state on a large scale in the interest of education. People do not object to this increased

taxation because they realise that the school tax money cannot be diverted into any other work. Universal taxation helps the cause of compulsion in the following way. (1) Every one has to pay for the support of the school and they are therefore more interested in making use of it, (2) Plenty of money is provided to finance schools without bringing the educational department into competition with other departments of government in order to secure funds.

Japan.—It would be interesting to study the effect of compulsory attendance laws in Japan. I shall merely indicate that in 1880, 41·6 per cent. of the boys and girls of school age were in school, while in 1911, under compulsion 98·14 per cent. of the boys and girls of school age were in attendance at some schools. Three hundred daily newspapers are circulated and read even in the remotest villages of Japan. When I was in Japan in 1918, I observed that the rickshaw coolies who pulled me through the streets to the shops carried newspapers with them and read them during the time they waited for me to make purchases. Let us get away from the idea in India that education only fits one to be a “babu” in some office.

India.—But turning to India we rejoice that she too is making progress in the direction of compulsory attendance. The State of Baroda has been a pioneer in this field and has accomplished good results in so far as compulsion has been enforced. In British India Mr. Gokhale began a campaign for compulsory attendance in 1910. His bill providing a very conservative form of compulsory education was debated at great length but was defeated, thirty-eight votes to thirteen. The campaign however then started was not futile and we have lived to see the day when the machinery of legislation has been provided whereby compulsion may be brought into operation in at least seven of the important provinces of India. (Bombay, February, 1918; Bihar and Orissa, February, 1919; Bengal, May, 1919; United Provinces, June, 1919; Punjab, April, 1919; Central Provinces, May, 1919; Madras, October, 1920). The provisions of these acts are similar and were all passed about the time of the introduction of the Reforms.

You are familiar with the Punjab Act, No. VII, April 1919, providing for compulsory attendance at primary schools. In brief, it provides :

(1) Parents of boys between the ages of six and eleven years are required to educate them unless there be a reasonable excuse.

(2) The local authority, i. e., the municipality or district board, must take the initiative and resolve by a two-thirds majority to have the Act applied to all or part of its area.

(3) Government examines the proposed scheme submitted by the local authority and may sanction, refuse to sanction

or return the proposal to the local authority for further consideration.

(4) The local authority may impose additional taxation to meet the expenses.

(5) It is possible to levy a special education cess payable by all or any of the persons resident or owning property within such area.

(6) The number of days in the month and hours per day are to be fixed by the local authority.

(7) Exemptions are provided as follows :—

(a) No school within two miles walking distance.

(b) Excused on religious grounds

(c) Efficient instruction elsewhere.

(d) Sickness.

(e) Permanent bodily defect or infirmity.

(8) School accommodation and equipment are to be provided by the local authority.

(9) Free fees are to be granted.

(10) Parents may be fined up to Rs. 5.

(11) It becomes unlawful to employ boys who should be in school and provides a fine for the employer up to Rs. 25.

(12) School attendance committees are to be constituted by the local authority.

I believe that the provisions I have listed above as No. 5 and No. 12 will in time prove to be the most useful and effectual in the operation of the Act. I have not yet heard of any municipality or district board which has had the courage to avail itself of the privilege of making a special education cess and I doubt if the provision against child-labour is being very rigidly enforced but both of those measures when enforced will be of great benefit.

Another form of voluntary compulsion is provided under the Co-operative Societies Act and is operating very successfully in many places and communities. The members of a compulsory attendance co-operative society bind themselves together to educate their children or submit to a fine in case they fail to do so.

We are thus provided with the legislation under which we can take a great step forward in our rural education. It is defective only in so far as it does not go far enough.

(a) It does not include girls and until we have educated mothers in the home we cannot hope for their co-operation in the education of the children.

(b) It is not so likely to be applied to backward rural areas where there is greatest need for compulsion.

(c) It leaves too much to the initiative of the local authority.

(d) The Act does not provide for the opening of schools where they do not already exist.

However the legislation is good as a first step in the right direction and we should all band ourselves together as inspectors and teachers, administrators and citizens to extend its application throughout all our rural areas.

His Excellency, the Governor of the Punjab, in his opening address before this conference pointed the way in which we are tending on the subject when he said, "Unless we can effect a voluntary change in the school going habit which will lead to a prolongation of school life, then statutory measures prescribing a definite school going period will become inevitable."

The Honourable Mr. Richey, in the latest Quinquennial Educational Report for India (1917-22) remarked, "But there are not wanting signs that the time is fast approaching. has in fact been reached in many areas, when reliance on a purely voluntary system will prove ineffectual and uneconomical."

The Director of Public Instruction, Sir George Anderson as you all know, is an able advocate of the extension of compulsion in the Punjab. In his presidential address before this Conference he called your attention to Mr. Mayhew's Book, which contains the strongest appeal for compulsion we have yet had. After remarking that he feels that Mr. Mayhew is unduly pessimistic about the impossibility of *any further* progress under the voluntary system, says, "Still I agree with Mr. Mayhew that the real line of advance lies in compulsion and it is therefore pleasing to hear from our friend, the Inspector of Vernacular Education, that there are now 44 municipalities and 709 rural areas under compulsion" and then the Director goes on to suggest that he hopes that by this time next year the Inspector will be able to inform him that the number of areas under compulsion has been more than doubled.

Thus have our leaders and advance thinkers pointed the way for us, in fact they have more than pointed the way, they have provided the legislation whereby we may lead the people under our care to accept the conditions laid upon down and apply compulsion at once.

II. Difficulties of Compulsory Attendance in Rural Areas in India.

We should not minimize the difficulties and practical obstacles in the way of applying compulsory attendance to all areas and communities. The problem connected with the introduction of universal free education throughout India or even in our own Punjab are very real ones and will have to be satisfactorily answered. A great many difficulties could be listed and some of you in this Conference during the discussion period will doubtless want to mention some of them. The following objections have been brought to my attention :—

(1) *Difficulties of Administration of Compulsion.*—It will be very difficult to get an accurate census of the names and ages

of children in India. The experience of census takers with the difference of parents to tell the age of their children does not indicate that it would be an easy task to complete an accurate school roll.

Further, with a complete list of the boys and girls of the school age in hand, it will be hard to get the proper attendance officers or committees. As Mr. Mayhew points out, it would be lamentable if "a board of attendance officers corrupt and extortionate will be added to the other plagues of village life and the only result will be bitter resentment and occasional riots."

(2) *Insufficient Accommodation and Equipment*.—Existing schools will have to be enlarged and new schools opened to admit those who should be in school. The problem is made more complex because of social and caste distinctions making it necessary in some places to provide separate accommodation for certain classes. Further boys and girls cannot read in the same school in India. Again the number of children to be accommodated under universal compulsory attendance would be so great in India that the task of schooling them would be gigantic.

(3) *Teachers*.—We do not have enough teachers now and it would not be easy to find persons of the right sort who would be able or willing to undertake the necessary training. The Director is right when he calls our attention to the fact that in Europe and America, elementary schools are taught mostly by women. Under universal compulsion we should require women teachers in India not only to complete the number of teachers but also because primary children need women teachers in the school more urgently if we are to compel them to leave their mother's control for a large portion of the time each day.

(4) *Social and religious Customs* interfere with compulsory attendance. Child marriages and early betrothals are hard to control.

(5) *Religious Difficulties*.—Most parents and communities rightly want their children taught in religion in the school. The diversity of religious beliefs makes this ideal impracticable.

(6) *Educational Problems*.—(a) Villagers are asking if the school does not unfit the child for hard industrial or agricultural work, in fact unfit him for village life so that he is discontented and unhappy and lost to his parents. (b) Is it worthwhile to educate when 39 per cent. of those educated or partly educated are to lapse back into illiteracy? (c) What are the advantages of literacy in a village of illiterates?

(7) *Public Opinion*.—Public sentiment is not yet favourable to education in the villages. The villagers do not want to be

educated because they don't know its advantages and those who are educated and enjoy the benefits of their education in exploiting the others do not care to have universal education or do not think the uneducated are worth educating.

(8) *Economic Problems*.—Many of the parents are too poor to educate any of their children and most are too poor to educate all of their children. The income from the child's labour is required to eke out the meagre existence of the average village family and in case the child himself cannot work he can be used to look after the children while the mother goes to work. There is little room for drones in the bee-hive of village life.

(9) *Climatic conditions* are not favourable to compulsion. The rains, extremes of cold and heat, floods, malaria, plague, epidemics and sickness all combine to make attendance very irregular.

(10) *Financial Problems*.—The funds for financing all the new schools that would be required and at the same time allow for the natural expansion of existing schools cannot be provided without additional taxation and all politicians and administrators know how every proposed increase in taxes arouses the most bitter antagonism.

III. Benefits under Compulsory Attendance Laws.

In the face of these difficulties and many others as well, I still firmly believe in compulsory attendance at primary schools in India for the following reasons :—

(1) I am responsible for the education of about 1,800 Christian boys and 1,500 Christians girls of the school-going age in Kasur Tehsil. These all belong to the depressed classes and only about ten per cent. of them are or have been in any kind of a school. We have made an earnest effort to educate these children under the voluntary system in Mission schools, District Board schools, and even in expensive boarding schools and have made some progress but I am convinced that we cannot go much further without the help of compulsion. I am sure that the failure of these children to attend school is not due to their own indifference or in all cases to the inefficiency of the teacher and the school but to circumstances over which they have no control. My opinion is confirmed by an interesting study of 49 villages in Bihar and Orissa (1920-21). Out of 9,491 boys aged five to sixteen years only 2,464 were in school. Of the 7,027 who were not in school 46·03 per cent. assigned poverty as the cause for non-attendance ; 33·78 per cent. had to earn a living ; 17·58 per cent. could not attend because of the unwillingness or indifference of parents ; 2·61 per cent. reported absence of proper educational facilities.

(2) In the second place, my brief experience among illiterates has led me to believe that there is much latent genius among them

which might have had a chance for development under a system of universal education.

(3) I favour compulsory attendance because of the reflex effect it will have on the school. Schools will become more efficient because of (a) regular admissions and attendance; (b) one teacher schools can be replaced by larger units; (c) the period of school attendance will be lengthened so as to insure a firmer grasp on literacy; (d) the school will become representative of the whole community—a real community centre; (e) primary teaching will receive more attention and the congestion in the first class will be relieved by equalizing the numbers in the first four classes at least.

(4) Compulsory attendance in one generation will raise the whole tone of rural life and thus become automatic.

(5) The secondary schools and college, the vocational schools and professional colleges will have a wider field from which to draw their students and can therefore raise their entrance requirements and standards.

(6) The money now being spent on primary education will be spent on a more fruitful manner and the lapse into illiteracy will be minimized in a literate community. More funds for rural education will then be forthcoming.

(7) Primary schools will be made free and at the same time be more likely to be better housed, properly equipped, and taught by trained teachers.

(8) Compulsory attendance will guarantee to children of both sexes, of all classes, of all religions, their birthright to enjoy the fullest possible life, to render the most useful service to their families and to their communities, and to fulfil more nearly the purpose and ideal of their Creator.

RURAL EDUCATION AND COMMUNITY WELFARE.

BY S. JODH SINGH, B. A.,

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Rural Population—an important factor of the community and the State.

Princes or Lords may flourish or fade
A breath can make them as breath has made
But the bold peasantry, the country's pride
When once destroyed can never be supplied.

A very large portion of the population of India is rural and the chief source of their sustenance is Agriculture, other industries there being directly or indirectly dependent upon it. Hence the condition of the peasant seems to be a fit subject for a discussion on the welfare of the rural community.

The peasant lives in such surroundings, where nature is bountiful and his labour is abundantly rewarded. He can get plenty of fresh air and clear and pure water to keep him healthy, and enough nutritious food to make him stout and strong. There is no lack of beautiful scenes and other healthy influences to make his life cheerful and contented. If he could lead a sober and simple life, the crops raised by him on his fields will give so much yield as will be sufficient not only to sustain him and his family, but also will leave a surplus to help others, who look to him for the supply of cereals, textiles, butter, milk and other raw materials, so essentially needed for the daily requirements of life. Moreover he is the chief contributor to the Exchequer of the State in the form of Revenue and has always been foremost in supplying manpower to His Majesty's army in peace and in war. Hence it is clear that the Indian peasantry whether in respect of their numbers or their usefulness to the country as well as to the Government, are an important factor in the economic development of the community, and their welfare is the urgent concern of the nation as well as of the State.

Present backward condition of the Rural Population.

Though with the advance of scientific knowledge new inventions have become possible, industrial processes have wonderfully expanded, and hand labour has been replaced by machinery with the consequent increase in the output which sent out to the profitable markets of the world adds to the general prosperity and wealth of the nations. Yet in India it is only the urban people who are benefited by such an advance while the current of prosperity passes by the poor peasant leaving him quite unaffected. He is still groping in the darkness of backwardness, which is due to the following causes :—

(1) He is illiterate and cannot fathom the depth of his fallen condition. His mental, moral and physical development is inadequate and it never occurs to him to think of the means of his uplift.

(2) His methods of cultivation are unscientific and defective. The agricultural implements he uses are of an old type. His cattle are of poor breed, under-fed, and improperly kept. He is ignorant of the kinds and uses of manures to recoup or increase the fertility of his land. He is careless about procuring good seeds. His land has been losing fertility by long and constant use and cannot yield good produce. He cannot improve methods

of irrigation on account of constant subdivisions and fragmentation of the holdings and cannot protect his crops from the attacks of pests. He cannot profitably market his produce. He is very conservative, and is following an occupation which is not run economically, so he finds it very hard to make both ends meet and is becoming poorer and poorer day by day.

(3) He is whimsical and a slave to absurd customs and ceremonies, the observance of which involves heavy expenditure. His wife is fond of ornaments and costly clothings and would have them even at the expense of their urgent necessities of life. He has begun to lead a luxurious life which is very expensive. He is given to litigation on which his wealth is wasted. His income thus falls too short to meet his requirements and he is obliged to incur heavy debts at exorbitant rates of interest, in payment of which his whole property—moveable as well as immoveable—is snatched out of his possession and he is left on the verge of bankruptcy.

(4) The village is filthy, the heaps of manure are stored near the houses. The streets are dirty. The same house is used as a dwelling place as well as a cattle-shed. The houses have no windows or ventilators and so are dark and dingy. The water procured for drinking purposes is generally impure. Vaccination and inoculation and other precautionary measures to protect health are abhorred. Consequently the village is frequently visited by epidemics which every year take away many precious lives and leave many households in a miserable condition.

(5) The women are also illiterate and are kept in a degraded condition. Their chief duty is to make dung cakes and to grind corn. Their sense of beauty, decency and cleanliness becomes dead and they cannot bring up healthy and cheerful children. They are bought and sold like cattle and are a source of disputes and litigation which always end in ruin.

Means of uplift.

Now having thus found out the causes of the degraded state of the rural people, it becomes necessary that early steps should be taken to ameliorate their backward condition, otherwise it is feared that it may retard the progress of the other communities also. The proper remedy for this backwardness lies in the universal spread of education supplemented by constant and intensive work in the rural areas.

Education in Schools for Children.

The people even in the rural areas realize the benefits of education, and are anxious to send their children to schools. But owing to the present curricula and the methods of teaching in vogue in these days, the education imparted in schools is of too

literary a type and thus cannot suit the daily conditions of rural life. A majority of the students find no interest in it, and leave it in disgust at different stages in their school careers. Such students sometimes become indifferent to their ancestral occupations and only add to the backwardness of the community. At the same time, there are some such students also—though only a few—as by dint of force can manage to pass the middle, matric. or even the higher standards, but in order to improve their lots by securing some jobs suiting their literary tastes, they always migrate to the urban areas, and by losing all love of and sympathy with, the rural conditions, they never think of returning to their homes in the villages and settle permanently in the towns. So this drift of the best men from the villages continues. It is thus apparent that education, as at present given, does more harm than good to the rural population. Hence the schools in rural areas do not flourish and have become unpopular. As the aim of education, stated briefly, is to fit one for life, therefore, so long as it cannot lead its devotees to the right goal, all efforts to popularise it are wasted. In order to make it really useful, it is, therefore, necessary that the scheme of work and methods of teaching prevalent in rural areas should be overhauled.

To attain this end the schools should be closely connected with rural life, and the village activities and other useful movements, in which the village folk take interests, should be made the means of educating the children, so that after finishing their course, the boys on leaving the school may be well equipped for the work they have to do and feel sympathy with and interest in it. In the Primary schools the teaching of all subjects should be based on Agriculture. A small plot of land may be attached to every school in which the children will get a chance to do work with their own hands and feel interest in it. Materials for daily lessons should be taken from the experiences and environments of the children.

In the secondary school, more emphasis should be laid on the teaching of elementary science,—Physical Geography, Personal Hygiene, Agriculture and the like. To make the boys acquainted with the theory and practice of Agriculture, which is the staple industry in rural areas, Agricultural farms should be attached to all the secondary schools and run by the students themselves.

Teaching of other subjects should be co-related with Agriculture. Such text-books should be procured as will help the teachers and the taught to do the work on right lines. Scouting, Manual Instruction and Music-for-all which are very healthy and useful movements, should be encouraged and popularised, as their value in providing useful hobbies to the children such as active participation in games, visiting the fairs and shows, singing of Scout songs and Red Cross work, etc., cannot be overestimated. Functions like Parents' Day, Old Boys' Associations, staging of National Plays, Exhibitions and Demonstration may also form a

part of the school work and may be held at regular intervals and on festive occasions. Such movements will go a great way to teach the students co-operation for common ends and implant the ideal of self-sacrifice and service in their minds. They will link the school more closely with the community and will make the students as well as their guardians take more interest in the welfare of the school which in itself will become a community and will afford chances to the students to learn civic duties, too, so that on attaining manhood they will become good and loyal citizens. Their interest in their environments will increase and they will begin to evince love and liking for their ancestral homes.

Education of the girls, also, is as important as that of the boys, so it should go side by side with the latter, for when they grow up, they will have to run the homes and bring up the children. Educate the girls and you will have happy, cheerful and healthy generation. In villages where to maintain a separate girls' school is not possible as yet, the girls may be sent to the boys' schools for elementary education, as up to the ages of 8 or 9 years, the boys and girls mix and play together in the homes and the streets, so they may mix in the schools also. But after that age their schools must be separate.

Propaganda Work.

The second means of the uplift of the rural population is propaganda work. Adult schools may be started for the grown up people but they have only a limited scope, and those who join them can only acquire the rudiments of 3 R's, as owing to over-absorption in their callings, they cannot spare enough time for higher studies. But with ripe years, their faculties become mature and they can better concentrate their attention on advanced topics, observe more closely and draw their own conclusion and form judgments, so the stock of their information may be increased by means of lectures, discussion, songs and plays, magic lantern shows, demonstrations, competitions, and posters and papers, etc., etc.

The Government departments of Agriculture, Health and Co-operation are already doing their best for the welfare of the rural community in their respective spheres, and the newly constituted Rural Community Boards in tahsils and Districts will also render useful help, but the village school teacher can do much more, only if he is conscious of his duty and has sympathy with the ignorant villagers. He can make his school the centre of all useful movements, started for the welfare of the people. He can train the scholars of his school to assist him in his efforts and can draw a scheme to continue this work throughout the year permanently and regularly. Where there is a will there is a way, if he has a will to do the work, he can get enough leisure and innumerable chances to collect the village folk for the purpose.

and proceed with the propaganda work on the lines suggested below :—

Teaching of reading and writing in adult schools, study of healthy literature supplied from the village libraries, posters dealing with important topics and pasted on the walls of prominent places in the villages, will help steadily to remove illiteracy from the villages.

With the help of lectures, talks, demonstrations, songs and magic lantern shows on such topics as good ploughing, good implements, good cattle, good seed and manure, protecting the crops from pests, consolidation of holdings, improving the methods of irrigation and marketing the produce profitably, etc., the advantages of the good methods of cultivation may be brought home to the ignorant and conservative farmer, and his interest may be aroused in their usefulness in the hope of raising good crops which will bring him much profit. He may be taught also that by sowing rotatory crops or taking to subsidiary industries in his idle hours, he may still further add to his income.

Waste of money on ornaments and costly clothes for children and females and on the observance of absurd customs and ceremonies connected with marriages and deaths and on litigation may also be checked and social uplift encouraged by forming social Panchayats in the villages.

Co-operative movements may also be made popular in the villages, as no other department helps the agriculturist more than this. It supplies capital for the betterment of cultivation at low rates of interest and encourages thrift and saves the zamindars from debts.

The simple principles of sanitation relating to the cleanliness of the village and precautions against the outbreak of epidemics, may be explained to the people. Rat killing and inoculation against plague, vaccination against small-pox, purifying the water of the wells against cholera, destruction of mosquitoes and use of quinine against malaria, etc., etc., may be popularised. Parties of students may be sent out on excursions to destroy mosquitoes, to distribute quinine or do some other services to the sick and the needy and thus their precious lives from the attacks of serious diseases may be saved. The people may be persuaded to store manure in pits dug for the purpose. Such a process helps to keep the vitality of the stock and keeps the air fresh and free from impurities. Simple principles of Domestic Hygiene may be explained to the people and advantages of having windows and ventilators in the sleeping rooms, plastering the roofs and walls of the houses may be clearly impressed on their minds. Thus by forming habits of cleanliness, they will improve their physique and become better fitted for the discharge of hard duties of their lives.

Lastly it can be made clear that the wife is the better half of the pair, and so she deserves greater regard and respect. She should be set free from the bonds of slavery and should not be required to make dung cakes and grind corn, but she should be given proper education to fit her for household duties and occupy her proper place in the family. She can plant flowers and give birth to flowerlike children and thus make the home a sweet home.

Thus by teaching the farmer how to keep his five enemies, i. e., illiteracy, ignorance of his farm economic, debts, epidemics and degenerated condition of women, always at a safe distance from him and by making him hardy, hearty, healthy and high-minded, his backward condition may be improved and he may be able to occupy his proper position amongst the civilised communities.

HOW TO START COMMUNITY WORK.

BY LALA DUNI CHAND, B. A., B.T.,

Headmaster, Government High School, Akalgarh.

Introduction :—

Ten years ago the teachers in this province thought that their sphere of work was limited to the four walls of their school-house. They had to teach their classes and no more. They seldom mixed in the society from which their pupils came. Their relations with the parents of their pupils were generally limited to their neighbours or to those with whom they otherwise came in contact. The P. E. Code was there which assigned extra-mural work to the teachers but the rule was more honoured in the breach than in the observance. At best the extra work took the form of supervision of the evening games or looking after the conduct of a few who had proved themselves habitual law-breakers. Even this work was confined to a few of the best teachers and then again their influence was limited to their scholars only. The modern conception of a teacher includes much more than the mere imparting of instruction. It is the dispelling of the darkness of ignorance, wherever present. Not only must the children receive education but the light of knowledge and truth must radiate to the very homes from which they come. Without this higher ideal before a schoolmaster education becomes narrow in its aim and limited in its utility. It becomes a means of civilising a small fraction of the people rather than a beneficent influence permeating the whole community. Hence this conception of our schoolmaster raises him from the low status of a pedagogue that he enjoyed before, to the noble rank of a community leader.

For the achievement of this ideal a teacher should start community work for which there is wide scope in our province as the

Punjabees, through a virile and manly people, are generally poor and ignorant and hence the visitations of plague, malaria and other epidemics from year to year. How the educator of the present can undertake this task and play his part in ameliorating the conditions of the people is the point which I shall now consider.

Activities enumerated—

There are three chief problems which demand our immediate attention in the Punjab, *viz.*, (1) Improvement of the Sanitation of our villages, (2) Rapid Spread of Education, and (3) The improvement of the economic condition of the people. Let us take these three problems in order and discuss briefly the ways and means by which they can be solved.

Sanitation—

I first take Sanitation. The sanitary condition of our towns and villages is abhorrent. Heaps of rubbish are kept on all sides and these give a foul stench especially when they decompose. People take mud for making houses from just outside their villages and the result is that large and deep stagnant pools of water are a familiar sight after the rains. Further, the wells for drinking water are neither covered to prevent falling of leaves and dust, nor sufficiently away from the heaps of rubbish or pools of water. Again, the mud-houses in which the villagers live are quite insanitary and infested with rats. Add to these the ignorance of the people of the laws of health so that they are seldom clean in person or dress and we have the necessary conditions which have made our villages the breeding grounds of all sorts of diseases. The ideal schoolmaster should apply himself earnestly to the noble task of improving these conditions. His efforts should never be limited to the mere giving of advice. To start with, he should undertake the improvement of the sanitary conditions of his school and make it a noble house with clean surroundings. He should next approach the big men of the town or village and seek their help in its reform. He should educate the public mind in all possible ways—teaching the laws of health and sanitation through school boys and demanding a higher standard of cleanliness from them and preaching to the people directly. In villages where there are no doctors the schoolmaster would be a blessing if he knows how to render First Aid to the injured or to treat simple ailments, *e. g.*, Malaria, etc. It would be better if the village teacher received some encouragement to study Unani or Ayurvedic systems of medicines, and allowed to practise out of school hours, as the village folks have faith in these systems. Even now some teachers are also Hakims and this way have made themselves not only more useful to the public but can also eke out their petty income by this work. This also extends their influence over the villagers.

Education—

The rapid spread of education is another pressing need of our people. Though education is spreading through Boys' and Girls' Schools at a quick pace, it is difficult to educate all the people in this way. The adult school can help us in this task. It can banish illiteracy by making the adults pass a literacy test. It can arouse an intelligent interest in useful knowledge by arranging for informal talks on Sanitation, Agriculture, Co-operation and other useful subjects. Although our adult schools have achieved much in the past, the field for work in this direction is still very wide and the Government should allot more funds to make these schools more useful and efficient. The present practice is that the teacher of the Day-School has to work at night and gets some allowances for this work. But it would be better if in large cities where there is a larger population of workers and labourers a full-fledged school be established for the benefit of these classes.

A necessary concomitant of the adult school is the library which can be utilised as a means of creating a taste for healthy and useful reading. The Department has already ruled that the village school library should be open to the adults of the village but there is considerable room for expansion in this direction as very few village schools have got libraries.

In addition to this an influential schoolmaster can help the formation of voluntary education societies for children and prepare the people for compulsion under the provisions of the Compulsory Education Act. Again the education of the girls is progressing at a very low pace and it would be better if the village teacher's wife could receive some education of the girls' school through Government encouragement or through her husband and start a girls' school there and become its mistress. In this way the work of enlightenment begun by her husband would reach the womenfolk through the wife.

Economic condition of the people.

We have now to consider the means for the improvement of the economic condition of the people. The bulk of the people in villages, in spite of the blessings of the splendid irrigation system in the Punjab, still remain poor. The causes of this poverty are well known—lack of thrift and bad habits and customs of the people, ignorance of the improved methods of agriculture and the decline of cottage industries. The Jats are extravagant on marriages and other occasions. They are not thrifty and do not know how to accumulate for their farms and hence are generally in debt. The teacher can encourage the habit of thrift among them by the formation of Thrift Societies. He can save them from the clutches of the money-lenders by forming Co-operative credit Societies,

Methods of agriculture and cattle breeding should also improve and if the teacher knows the principles of manuring, use of new agricultural tools and implements, the principle of rotation of the crops, the choice of seeds and improvements in cattle breeding, his knowledge can be easily diffused among the villagers. In schools where agriculture is taught and agricultural farms are kept, the villagers can see these principles brought into practice and the teacher of smaller villages can go there and study these principles to explain them to the people of his village in the end.

Another cause of the poverty of the villagers is that they have no other source of income except agriculture. There are many small industries which they can carry on in their leisure hours and eke out their petty income. The most suitable industries are weaving, bee-keeping, silk-worm rearing, poultry farming, cattle breeding, tree planting, etc. Detailed information about these should be available in every village library and the village teacher should help the starting of those industries which are suited to the condition of the village.

Litigation is another cause of the poverty of the people. Petty disputes can be easily settled in a village Panchayat, and in this work the teacher can do a good deal if he has got an established standing and influence in the village.

Ideal Set.—In what has been said above I have assumed the teacher to be an ideal personality who has wide sympathies, broad outlook and an intelligent interest in every thing which can benefit the villagers and improve their lot. If he is to play this noble part in the rural economy, he should be equipped with the necessary knowledge and training, and hence our Normal Schools and Training Institutions should provide for this training in addition to the work they are already doing. The standard for admission should be raised so that better men are recruited. Moreover, the Inspecting Officers should treat the village schoolmasters better than they do now so that the school master may rise in the estimation of the village folk. In this propaganda work all the beneficent departments can co operate. The teacher, the Co-operative Sub-Inspector, the Doctor, Civil and Veterinary, as well as the village officials, the Lumberdars, the Patwari, can all work together for this noble purpose and the efforts of the one can be supplemented by the other. They can easily form a committee to carry out anti-plague, anti-malaria or other useful work. The colleges and high schools in towns and cities owe a duty to their country to help them in this good cause and can arrange excursions of teachers in parties to their neighbouring villages as they are generally better informed than the village teachers.

Community Work in Government High School, Akalgarh.

Akalgarh is a small town in the Gujranwala District, and has a Government High School. The Headmaster drew up a

list of all the villages which were the feeders of the school and started community work among them. The first on the programme was Jhattanwali, a village at a distance of 8 miles from Akalgarh. On Sunday the 14th November, 1926, the boarders from this village were sent to inform its people that a party of teachers from the Government High School, Akalgarh, was coming for an informal talk and lecture illustrated by Magic Lantern slides. The school boys reached there at 7-30 A. M. My Assistants and I reached there at 3 P. M. and went straight to the school building. Soon a party of villagers gathered around us. We had talks on Sanitation—the greatest need of the village Jhattanwali which has deep pits of water around it which have made it a prey to malaria. After about two hours' talk all present were photographed with the school camera. This was a good advertisement for the night lectures.

At 8 P. M. the villagers mustered strong in the *baithak* of L. Mathra Das to hear the lecture, no doubt attracted by the pictures on the screens which many mistook as the *tamasha* of the bioscope. It was interesting to see the Jats coming with their *hookas* as they do in their *daras*. I addressed them first on "The Three Enemies of Mankind," the rat, the mosquito, and the fly, and explained how the diseases caused by them could be prevented and cured. The next speaker described the evils of drink and emphasised how the drink habit was given up in other countries. He also explained the means by which the villagers can improve their economic condition. He was followed by another teacher who spoke on "Our Secret Friends and Foes," i. e., germs which are friendly to man and germs which are his enemies. These lectures kept us busy for two hours. At 10 P. M. the people dispersed all eager to hear such lectures now and then. On the next day we returned to Akalgarh on foot and reached in good time to attend the school at 9-50 A. M. after covering a distance of 8 miles.

My next excursion was to Ramke Chatha on 27th November 1926 where I, with three other teachers, worked on similar lines and succeeded in stirring the villagers to form a committee for the improvement of its sanitation, the Headmaster of the L. M. School there having promised to carry on the work after us. For this work the slides were borrowed from the Lahore Central Museum but I am now trying to secure some good sets from the Lyallpur Agricultural College and the Red Cross Society. I have also sent to the press some handbills in the vernacular about Plague, Malaria, Cattle breeding, etc., which will be given to the senior pupils for community work. When the new slides are received and the handbills are ready, my staff and pupils will be able to carry the message of health and happiness to all the villages in the *Ilaga* and take some share in improving the lot of our people.

THE VILLAGE SCHOOL IN THE SERVICE OF AGRICULTURISTS.

BY DR. MASON OLCOTT.

The village school can help largely in forming the new India well educated, healthy and progressive. If the rural school is redirected it can share in redirecting the whole life and thought of the nation. It can serve Mother India by serving the agricultural classes which form the great majority of her children.

Village education is not an end in itself. It finds meaning and value in social helpfulness. One way it can help is by spreading literacy, but literacy alone is not enough. The ability to read and write is a powerful instrument that may be used for good or for ill. A literate may employ his talents either for the welfare of society or for his selfish interests. The village school fails if it turns out *selfish* literates. Its former pupils must prove socially serviceable. Such an end is possible *only* if the school itself is social in its life, and serviceable in its works. How, then can the village school be of service to agriculturists? Let us consider this question by asking ourselves six more questions: (A) How can village schools improve the culture of agriculturists while retaining their interest in the land? (B) Why is there so much retardation in the rural schools and how can it be prevented? (C) How can village schools promote rural hygiene? (D) How can the teaching of nature study and the use of the agricultural plots in the primary schools be improved? (E) How can adult education be made more popular in rural areas?

We shall take up these problems one by one. As we do so, please all think of your own experiences. Your answers will be better for you than mine, because they will better suit your conditions.

(A) How can village schools improve the culture of agriculturists while retaining their interest in the land?

1. Rural education can do much to improve the culture of agriculturists by *bringing the curriculum in close touch with the problems and aspirations of village life*. Reading, writing and arithmetic are merely tools. All tools are meaningless and dull unless they are used in actual life. Reading for the mere sake of shouting sounds palls on children, but interest will continue if reading is shown to be a means to answering the questions in the minds of the children and securing information that can be applied in the village. Reading now tends to lessen interest in the land because it is falsely regarded as useful only in leading to a Government post in the towns. Strangely enough, the overwhelmingly literary schooling in English that is now given is really vocational and utilitarian, as Mayhew aptly points out. Rarely does it promote either broad culture or interest in the land. But rural education that is intimately connected with

rural life can and will do both. The Danish Folk High Schools offer an outstanding example of success in imparting culture through a deeper understanding of rural life and work. In spite of the fact that they are not schools in the usual sense and have no examinations, diplomas, or compulsory attendance, and last and only a few months, still they have formed a factor second to none in the rejuvenation of Denmark during the last sixty years. (See Leake, Means and Methods of Agricultural Education, pages 241—245). The same kind of combination of *culture of the mind* and *culture of the field* has been put in practice in the community middle school at Moga, though under different circumstances. In rural elementary education mental culture is not fully attainable without an agricultural and village bias.

Such a connection of the curriculum with life has many advantages, especially : (a) It will foster a natural rather than artificial culture. Village life will be the starting point, but it should never be the end of study. A long series of agricultural readers has proved dull to rural children in America, because they were offered nothing they did not already know. An understanding of factors in the village will lead, with good instruction, to an understanding of provincial and national life. (b) It will foster interest in the land and its problems. Several schools that I know in America exemplify this. (c) It will give meaning and interest to what is studied. The fundamental tools of reading, writing and arithmetic will take on a new value because they are actually used. They cease to be mechanical and become vital.

2. The village schools can get their pupils to do *supplementary reading on interesting topics*, such as the improvement of agriculture, cottage industries and of hygienic conditions. They can also read the great Indian epics and folk tales. The teacher and children can also have special times for *reading aloud* such matter to illiterate adults.

3. The pupils can be taught to *give simple dramas* before their parents. These can be both good training for the children and interesting experiences for the adults.

4. *The pupils can be trained in habits of co-operation and service.*—I know of two schools where the children are regularly organized with officers and committees to help the school and the village. One boy rings the school bell. Another sees that the school is clean. A third takes charge of the small school museum. Still other children form a Panchayat to see that all the pupils come on time to school, and to reprimand and punish late comers and absentees which relieves the teacher of a great burden. The children are assigned to different parts of the hamlet to keep them clean and remove dirt and garbage from the streets on Saturday evenings. All of them march through the streets on Sunday in the morning singing lyrics in order to gather all the people for the religious services. Such responsible

co-operative service of others does much to promote a genuine kind of culture that does not alienate the children from the village.

(b) *Why is there so much retardation in rural schools and how can it be prevented?*

Before answering this question in detail let us look at the figures (Education in India, 1924-25, pages 52-53).

In the following table, I have compared the figures for all the people in British India with two groups found almost entirely in the cities and towns of India :—

PERCENTAGE ENTERING EACH CLASS IN RECOGNIZED
INSTITUTIONS.

Boys' Schools.

Class.	British India.	Parsis.	Europeans and Anglo-Indians.
I ..	100·0	100·0	100·0
II ..	49·0	89·2	78·8
III ..	33·2	80·7	68·7
IV ..	21·9	71·7	56·3
V ..	14·1	63·7	45·0
VI ..	9·8	57·6	34·1
VII ..	7·0	48·8	24·6

Girls' Schools.

Class.	British India.	Parsis.	Europeans and Anglo-Indians.
I ..	100·0	100·0	100·0
II ..	36·1	79·7	66·5
III ..	20·9	66·4	63·2
IV ..	12·0	51·4	42·8
V ..	6·6	29·4	32·7
VI ..	3·6	31·3	24·0
VII ..	2·1	21·2	16·9

Thus in the Boys' Schools, the percent. of Parsis entering the fifth class is $4\frac{1}{2}$ times and the percent. of Europeans and Anglo-Indians is 3 times—that of the general population. In the case of Girls' Schools, the corresponding are, respectively, 6 and 5. These figures show much worse the wastage is among the general population than among urban dwellers alone.

Why does such a small proportion of boys in the rural primary schools pass through the fourth class?

1. *The curriculum is out of touch with village life.* Ways of improving this situation are outlined above under question A.

2. *The attendance is very irregular.*—For boys' primary schools in 1925, the average attendance was 76·9 per cent. This low figure is due to the use of the children in gainful labour, and the apathy of most agriculturists to education, sometimes verging on hostility. More regular attendance can be secured by forming a panchayat of the leading men to bring pressure to bear on all the villagers to send their children regularly. The assistance of the older children will also prove valuable.

3. *The parents take their children out of school early and send them to work.*—In this connection note should be made that in 1921 India had 47,274,000 children between 5 and 10, and 37,168,000 children between 10 and 15, or a total between 5 and 15 of 84,442,000. At least half of these or 42 million children should be in school. This is much more accurate than assuming that the proportion of children of school-going age in the general population is the same as in Western countries. This assumption is absolutely false, although it is commonly made by people in higher authority (See Education in India, 1924-25, page 2, and Mayhew, the Education of India, page 228). Because people die much earlier in India than in Western countries, there is a larger proportion of children in the total population here than in the West. The teacher can do a certain amount toward keeping children in school, by explaining to the parents how inimicable this is to the real interests of the children and their families. The influence of village panchayats can do even more. But still better are the Co-operative Education Societies of the Punjab, the members of which pledge themselves to pay a fine if they do not send their boys to school for the full primary period. These societies are promoted and registered by the Co-operative Department. The bye-laws are voluntarily accepted by all who seek membership. Fines up to Rs. 50 may be levied and recovered by the Committee. (Education in the Punjab 1924-25, pages 15-16).

4. *The teachers do not have sufficient enthusiasm or training.*—Men of eager spirit, preferably those who have lived in a village, should be selected for teaching in the country, for they will face the difficulties more readily than others. Their training needs to be based on eight or nine years of school work and to be very practical in nature, continuing for two years. It is well to confront the students in training with the actual problems they must solve in the villages. In the Union Mission Training School, Vellore, the Model School has two standards under the care of a single teacher, and the students have supervised practice in such teaching. Rural Social Problems are also very carefully discussed.

5. *Instruction is worse in the lower classes than in the higher classes of the elementary school for the following reasons:* (a) Many of the children are too young to profit by any formal instruction. (b) They are neglected by the teachers in favour of pupils who better respond to teaching. (c) The poorer teachers are very

often assigned to this most important work. (d) Usually no one is held responsible for the progress of these children in school. These and other factors tend toward stagnation in the lower classes.

Various means can be used to overcome these weaknesses : (a) Children of five or six may either be placed in crèches or excluded. (b) The best teacher, preferably a woman, may be assigned to the lowest classes. (c) The head teacher should be held responsible for the children's advancement.

6. *Sympathetic guidance and supervision of the teachers is almost entirely lacking.*—The teachers are thrown on their own slim resources, with a critical word once or twice a year from an inspector after a cursory visit. They need to be shown step by step how they can improve their teaching. They are already discouraged, and they require intelligent encouragement. Constructive guidance by trained supervisors has done much good in the 250 village schools with which I am connected, under the Arcot Assembly.

C. How can village schools promote rural hygiene ?

1. *The children can be taught good health habits in school.*—They can be shown the value of clean bodies, clothes, buildings and streets, of good ventilation, of straight posture, and healthy exercise. Such things can be taught so as to make effort along these lines habitual. In one of our schools in an outcaste hamlet, the children collected a pie or two here and there. The proceeds were used to buy cheap combs, mirrors, and clay water pots. Now every morning before 6 A. M. school, the children line up to take turns in using these means of cleanliness, with no prompting at all from the teacher. They were cleaner than any children I have ever seen in such a hamlet. They were also given practice in washing their clothes. Every Saturday all of them cleaned the streets of the hamlet. Some of them kept the school clean and tidy. Similar practical measures can be undertaken in every village and hamlet school.

2. *The children can be taught something of the commonest diseases and the ways to combat them.* The older children can learn of what to do in case of accident or emergency.

3. *Health plays and demonstrations by the children for the whole village* are most useful in impressing ideas of good health on old and young. I have seen elementary school children give a play on the mosquito in a way that clearly showed to all the spectators the dangers of the pest and how to overcome it.

4. *Fuller Co-operation between the educational agencies and the medical and sanitary departments* will also do much for rural hygiene. The teachers might undergo some training in first aid

and be given simple remedies to dispense. Copies of bulletins on health should be given to the teachers so that they can read them aloud to all the villagers. Health lectures are also urgently needed. They could be arranged by the teachers and other village leaders.

D.—How can the teaching of nature study and the use of agricultural plots in the Primary School be improved?

1. *The aims of such work in the primary stage can be clearly thought out.*—The aim is not to give narrow agricultural training in order to impart special skill in agriculture. Such vocational training in agriculture cannot be given satisfactorily before the middle stage. The agricultural training given in the vernacular middle schools of the Punjab seems to be valuable.

The main aims of agricultural teaching in the primary stage may be here set forth (from Leake, Means and Methods of Agricultural Education, page 82): to create an interest in country life, to instil a respect for the occupation of agriculture, and to create a due regard for the earth and its products; (b) to cultivate thorough active and creative instincts, as distinct from the reflective and receptive, and direct them toward doing a definite thing; to train the pupils in ways and methods of acquiring information for themselves; (d) to connect the school with the real life of the village thus making the value and need of the school more apparent, and building on the past experience of the pupils.

2. *Nature study can be connected with realities, not pictures.*—Pictures of plants and their parts are useful in their way, but they should not comprise the whole of nature study as often is the case at present. Growing plants, living animals and their life cycles need to be studied.

3. *Individual children can be held responsible for their own parts of the school garden.*—This adds greatly to the interest. In one of the Christian schools in Chittoor District, each child has a foot or two of flower border around the school garden under his special charge for watering and weeding. On it he puts a piece of cardboard on which he himself has written his name. Every month the flowers are graded and the rank of each pupil is recorded on his cardboard sign.

4. *The schools can promote work on home plots by the children themselves supervised by the teacher.* This has been done in the United States and in the Philippine Islands with excellent results; (a) The responsibility thrown on the children develops their characters. (b) They learn to be skilful in a small way, spurred on by the emulation of other children. (c) This work involves the children's keeping full accounts of any money they spend and receive. (d) It gives the parents a clear demonstration of the application of new principles.

5. *All the agricultural work both in nature study and in garden plots can be correlated closely with all the other lessons.*—This will be of advantage to all parts of the school work. Agricultural work gains respect from being connected with the subject matter of books.

6. For all such work, *the teachers need an interest in agriculture and some training in it*, by short courses if long courses are impossible.

E. How can village schools promote agricultural efficiency ?

1. The schools can do much more than they are doing to *make their pupils literate*. Agriculturists cannot be really efficient without literacy, because : (a) Agricultural conditions are changing noticeably and can no longer be successfully met on the basis of age old customs. (b) The crops are now grown in competition with people in other areas of India and in other parts of the world, some of whom have improved methods. (c) The villager cannot afford to remain ignorant of the results of the researches of the agricultural departments. Literacy can be more successfully promoted by the following means : (a) better instruction given by more thoroughly trained teachers ; (b) curriculum starting closer to home and village problems and getting its motive from them ; (c) longer continuance at school through compulsory education ; (d) maintenance of literacy by good night schools and an abundant and cheap supply of easy, appealing literature.

2. The teachers can have their pupils read *popular bulletins on agriculture* both in school, and also to illiterate parents and friends. Such bulletins now exist but they do not live in people's minds and do much real good.

3. To spread the benefits mentioned in 1 and 2, there must be *more schools available to the agricultural classes*. Mayhew says that "nearly three-quarters of the villages in India have no schools." (The Education of India, page 227). Half a million villages in India are thus without schools.

4. For the sake of agricultural efficiency and other necessary ends, *new schools must be started in the villages* that are now out of reach of educational opportunities. Systematic planning by the Provincial Departments of Public Instruction is essential to avoid duplication and provide more nearly equal opportunities for all the children of Mother India, as the Punjab is trying to do. The Labour Department in Madras is organizing schools for the Depressed Classes who have never been allowed education and are supposed to be hostile to education. However, the parents themselves put up the school houses, a fact which shows that they are taking some personal interest. The right goal is to have

these outcaste children attend the same schools as caste children and receive the same treatment. In towns too many schools compete with each other, while 500,000 villages have no schools whatsoever.

5. *Efficient Central Schools* can be started for children in near-by villages. The statement has often been made that pupils will not go out of their hamlet to a primary school, but this does not remain true now. In my own experience, the great Arcot Assembly has at least five such schools in the North Arcot and Chittoor Districts, and the children do come, sometimes as far as a mile. I have seen a lame girl hobble to school on a crutch for a mile along the narrow ridges between the ricefields. These children are mostly outcastes and Christians of outcaste extraction. The Arcot Assembly is planning to combine many of its small one-teacher schools into efficient schools with several teachers. These can carry the children higher on the ladder to literacy and intelligent livelihood than small schools in little hamlets where both children and teacher are so isolated from the thought of the outside world.

6. *Much better co-ordination of the various agencies at work* is demanded for the solution of these educational problems which are probably as difficult as any on the face of the globe. The widest experience and best thinking are needed, but instead the workers in one kind of elementary school are ignorant of the attempts and accomplishments of those in other schools.

7. Better co-ordination can be fostered by *Educational Conferences in each Province representing all kinds of experience*, in Government inspection and Government schools, in local board schools, and in aided institutions. A free expression of opinion from many points of view would be most valuable in reaching reliable conclusions. Such conferences might be held every year or two. They would give even more vital assistance to the schools for the children of agriculturists than to the town schools, which are already firmly established and popular.

8. A similar *Conference for all India at the end of each quinquennium* would do an immense amount of good. At them Educational Policies could be formulated, similar to those of 1904 and 1913, but participation would better come from more varied sources. A Universities Conference was held in May 1924, but their problems compared with those of elementary education, sink into a minor place in furthering the welfare of India's masses.

9. Between such conferences, a *co-ordinating agency for educational research and the exchange of information* is most desirable, such as the Bureau of Education used to be before it was sacrificed on the altar of retrenchment. The fact that the control of education has rested with the Provinces since the Reforms

makes a central co-ordinating body more rather than less necessary.

10. The Provincial Governments have an inescapable duty to *provide money from their own funds and those of local bodies to extend compulsory education*. The challenge of Mayhew based as it is on long and varied experience, needs to be taken up: "The financial problem is not being fairly faced, and provincial Governments have not assumed the responsibility which few local bodies are prepared to assume." (*The Education of India*, page 263). "The need for a definite financial policy on which to base study and determined progress towards universal compulsion cannot be urged too strongly. India is too poor to afford any further extension based solely or mainly on the present wasteful voluntary system" (page 235). "It is for the Government to prescribe the minimum provision and the minimum expenditure from local funds, and to determine the steps by which the balance for the provinces as a whole may be raised through provincial taxation." (pages 239-240). The land revenue comes from the cultivators, but educational funds are not largely spent for them. Why should they not receive educational benefit from the taxes they pay?

F.—How can adult education be made more popular in rural areas?

In India, 91·8 per cent. of the population over ten years of age were illiterate in 1921 (male 86·1 per cent., female 97·9 per cent.) These conditions, in a country where the franchise has been widely extended, make adult education a very urgent necessity.

1. *Co-operative societies can be encouraged to undertake the education of their own members and other illiterates*. Such work has been started in the Punjab, Bengal, and Bombay. It removes the stigma attached to any education that is imposed by outside agencies.

2. *Much adult Education can be done through the use of the stereopticon*, pictures of agricultural implements and methods, and the life of other people and of animals can be shown. Slides can also be used for actually teaching reading. An excellent series of such slides in Tamil has been prepared by Mr. S. G. Daniel, a retired Educational Inspector for the Lecture Department of the Young Men's Christian Association. The illiterate leather workers, among whom I have seen these slides used, learned many letters very rapidly. They were so much interested in reading that they asked for the establishment of a night school. This experience has proved to me the enormous potentialities of this method of adult education.

3. *Libraries containing easy reading material can be started in every large village*.—The motive for learning to read will be

greatly intensified by the knowledge that there are abundant, interesting books, pamphlets and newspapers to read. Such libraries would contain such things as : interesting stories ; newspapers, periodicals ; popular bulletins on agriculture, storing and marketing crops, animal and poultry husbandry ; books on science, geography and history. Much good work in fostering libraries has been done by the Baroda and Punjab Governments and by a private library society in the Telugu country.

4. *The right kind of dramas will also do much to popularise and spread adult education.*—Plays are an important means of impressing ideas that make for real education. The Adult Education Committee of the Board of Education of England and Wales has recently presented a valuable report, “The Drama in Adult Education.”

5. *Students from colleges and schools can be led to volunteer for teaching during the vacations.*—This has been done in China in connection with the Daily Vacation Bible Schools. During the last seven years, over a quarter of a million persons have been taught in six thousand such schools. The Illiteracy Commission in China has enlisted volunteer teachers on an even larger scale in many cities, and substantial progress has been achieved in reducing illiteracy. Why is not something of the kind done in India ?

THE RURAL COMMUNITY AND THE TEACHER.

BY S. BALWANT SINGH, B. A.,

Vice-Principal, Government Normal School, Mianwali.

India is essentially an agricultural country and the overwhelming majority of its inhabitants dwell in villages. The concentration of law-courts, schools, offices, hospitals and other institutions at the head-quarters of Districts has been mainly responsible for bringing Indian towns into the lime-light, while the rural areas have lain in the background. This has resulted in dividing the country into two distinct areas, the urban and the rural. The uneven distribution of Western light and culture in the two areas constitutes a grave menace to the body politic. Two unevenly heated areas cause strong winds and storms, similarly two unevenly advanced areas contain latent elements of national upheaval and chaos. The safety of the land demands a more even distribution of culture. To bring the rural areas into the line with the urban areas we must do what was done for the towns. In fact we shall have to do much more for the villages, if we wish to raise their level at a quick pace. To achieve this end the village-teacher can and must contribute his legitimate share, which is by no means a small one. How far and in what ways

the teacher can help in this important work of nation building will be indicated in the following lines :—

1. The sanitary condition of villages is unspeakable. The heaps of rubbish decaying and stinking in the streets, the dirty stagnant ponds of water which breed mosquitoes and sometimes supply drinking water to the people, the wells that are allowed to remain unprotected against pollution and the wretched housing conditions that are the curse of rural life, these *inter alia* are the factors responsible for the appalling loss of life in India. Now that the Government is starting High schools of its own in rural areas here, there, and everywhere, it should be possible for the teachers and grown-up students of such schools to supplement the efforts and labours of teachers of village schools in carrying on an intensive and extensive campaign against the ignorance of the people, by delivering lectures, aided by the magic-lantern, if possible by singing songs containing sound lessons of sanitation and hygiene and by holding debates and discourses regarding the prevailing housing conditions, the existence of dirty ponds of water, the unprotected wells, the wastage of dung by piling it up in the streets, and defiling the water and air thereby, etc., etc. Let the staff and students of Government High Schools in rural areas tuck up their sleeves and gird up their loins and go into villages as villagers and preach the gospel of hygiene and sanitation and propagate scientific knowledge about the genesis and growth of malaria, plague, typhoid, small-pox, cholera, etc. Let them sweep clean, parts of dirty villages by way of demonstration as was recently done by a party of S.V. Students, Mianwali Normal School, and thus give a practical demonstration of the pleasing and healthy effect of good hygienic and sanitary conditions, as opposed to unhygienic and insanitary surroundings which deaden the mind and body alike. Let the teachers and the Inspectors of Co-operative Societies combine in organising Co-operative Sanitary Societies whose members would band together to keep their houses clean or pay so much fine instead. A few such societies would serve as a beacon-light to others. The teachers could also maintain gardens in schools and bring home to their students the desirability of growing flowers in their homes and keeping them otherwise clean and tidy. The Headmasters and teachers could also pay particular attention to the students' cleanliness of person and clothing. The weekly parade in the school compound to inspect the teeth, ears, hands and feet of students should also prove useful in advancing the cause of cleanliness and sanitation. The boys may also now and then be led in procession through villages singing songs inculcating lessons of health and sanitation.

Under no circumstances should an A. D. I. or D. I. be allowed to seat D. B. School boys in ill-ventilated, unairy buildings. It is better not to teach children than to teach them in wretched hovels and ruin their health. Houseless, open air schools are perhaps much better than schools in dark, dingy, insanitary holes.

The Ministries of Education and Agriculture might create a special branch to produce literature on village hygiene and sanitation, on agriculture and industries and similar other topics affecting the rural areas; posters of this nature written in bold letters might be put up on the notice boards of village post-offices and be also read out to boys and to audiences in places of worship, if possible. Now that dispensaries and hospitals are springing up in rural areas, the doctors in charge of such dispensaries might be required to deliver magic lantern lectures on the laws of health and hygiene and on the epidemics which effect rural areas. The teacher's duty would of course, be to carry on the propaganda work on the lines of the information imparted by the doctor. Pamphlets on common diseases and epidemics might also be issued by the branch referred to above for the guidance of the teacher and the general public. The teacher and the District Inspecting Officers might be required to read out such pamphlets to students and the people in villages and to deliver a fixed number of magic lantern lectures on such topics every quarter. The students of J. A. V. and S. V. Classes, while under training should also be required to deliver a series of lectures of this nature during their summer vacation.

The Headmasters and teachers of Government, Board, and private schools might be required to carry on propaganda work of the aforesaid nature within a radius of five miles from their schools. The celebration of 'Health Weeks' and 'Health Shows' should be a special feature of all Government, Board and recognized schools throughout the Punjab, at least once a year. Play-for-all should have a definite place in the time-tables of all kinds of schools, while refreshment-for-all should form a special feature of all A. V. Secondary Schools and Vernacular Upper Middle Schools in the summer season when such schools remain open from early in the morning to about 12 or 1 P. M. One or two handfuls of roasted gram would keep the children in good spirits and keep up their vitality. The nation is growing physically weak. It is therefore absolutely necessary to exert ourselves to the utmost to save the nation.

The Social Side :—National songs are a mighty force in creating national awakening. The Punjab needs a poet or poets who would sing in colours and paint in song the everlasting snow of the Himalayas, the heavenly grandeur of Simla and Kashmir, our splendid system of canals, the majestic rivers, the hardy peasantry and brave soldiery, the charms of Lahore and Amritsar, the sandy wastes of Mianwali, the mango-groves of Gurdaspur, etc., etc. We would then love our Punjab as English men love their England. Iqbal's famous song of *اچھا ہندوستان مارا* even though written in Urdu has captured the hearts and imagination of the Punjabis. The Inspector of Vernacular Education is said to be busy collecting suitable songs. When published in

book-form they should usher in a new era in the sphere of social life. Surely, one good Punjabi song could prove more potent than a hundred patriots. People in rural areas would listen spell-bound to soul-stirring, strains of sweet-voiced singers who might well belong to our schools. The music-for-all-movement would then have justified its existence. Similarly, singing parties and players should go out from our High and Middle Schools into their surrounding villages and organise social parties for the amusement of the rural people. The schools could also bring into existence amateur dramatic clubs and give dramatic representations of the various interesting and instructive mythical and historical characters. Poetical symposiums and contests might be occasionally arranged in schools (as is done at Bhera) and the village poets and people encouraged to participate therein. The boys might also be encouraged to recite interesting and stirring songs from their school and library books to rural audiences. Wrestling matches, Kabaddi, Gatka, Mugdars, weight-lifting, etc., could also be arranged by teachers and senior students. And there would surely be no harm in popularising Waris Shah's 'Hir,' Bulla Shah's 'Kaffis,' Kali Dass's 'Puran' and the like. The Punjab Text-Book Committee or Rural Community Councils would do well to make selections from such books, delete the undesirable passages and then publish them in a decent form for sale in rural areas at a nominal price, if possible. The rural people would then sit together and listen to these classics with rapturous joy. The S. P. S. K., the Lyallpur College, the Rural Community Councils and, if possible, High Schools, should issue pamphlets and posters on suitable topics. These pamphlets might be read out by the teacher and his senior students to the village people. Village libraries recently started should, if properly worked, prove highly useful. The Rural Community Councils would do well to start reading-rooms equipped with suitable dailies and magazines and appoint on a small honorarium, teachers and patwaries, retired or otherwise, to look after them. Magic lantern lectures by teachers, Inspecting Officers, Inspectors of Co-operative Societies and Agricultural Demonstrators could also ameliorate the social condition of the people. The District Boards could, with Government help, start and manage Circulating Libraries through D. B. teachers. It should be possible for boy scouts and others in schools to read out to people news of the day and interesting topics from a good newspaper or newspapers. The teacher could arrange *katha* or reading from the well known Hindu epics and from story books dealing with the life of the Prophet and the succeeding pillars and saints of Islam.

The economic side.—In certain selected vernacular and A. V. secondary schools in Rural areas agriculture should find a definite place in the curriculum. An agricultural farm should be indispensable in such cases. This farm must serve as a demonstration farm. Ordinarily, the teacher in charge of the farm should reap profits and suffer losses, if any, on account of the farm. Of course

reasonable allowance may have to be made for various things. The teacher might also be required to keep a stock of good seeds and improved agricultural implements (which should of course be supplied by the Board or in the case of a Government School by Government). Demonstrations of improved agricultural implements, of good seeds and Travelling Agricultural and Industrial Exhibitions should be held from time to time at such schools. In Normal schools the students should be taught the making and mending of improved agricultural implements as also cottage industries, as rope-making, basket-making, spinning, weaving, smithing, carpentry, soap making, etc. The teachers after undergoing training may be required to teach these things to their students.

The teachers should also work as Secretaries of Zamindara Banks, and of Co-operative Credit, Supply and Thrift Societies and contribute their share towards the removal of agriculturists' indebtedness, and the curtailment of unnecessary marriage and death expenses. If and when Panchayats are established in larger numbers and are granted reasonable powers and if at any time it is found advisable to give the teacher a voice in the Panchayats the teacher should perhaps render useful service in checking litigation.

The Department of Education might well grant one holiday every year to all schools on a certain fixed day when the teachers would take out their boys and ask them to plant trees on the road-side, river-side, canal-side, mountain-side, in the village common or in the school compound. The teacher would thus add to the fuel supply of the area and improve its climate too. The teacher may also be required to bring home to boys the disastrous economic effects of burning cakes of dung which only really belong to the soil and without which the soil must grow barren and unproductive. The teachers of schools in mountainous areas with reserved forests in their vicinity should impress on students the utility of forests, the need of their preservation, the disastrous effects of setting fire to them and the philosophy underlying the restrictions on grazing of certain animals in such forests.

SPECIAL SCHOOLS.

By Miss M. M. NEVE, M. A.

(Principal of Queen Mary College, Lahore).

By special schools we mean schools which are established with a special and definite object, and under this heading for boys and men we have:—

1. The Reformatory School in Delhi, with its Industrial Department.

2. The School for the Blind in Lahore.
3. The Railway Technical School in Lahore.
4. The School for Disabled Soldiers, most of whom are taught Motor driving, and
5. The Mayo School of Art, besides schools and colleges for the teaching of Agriculture, Engineering, Veterinary Science, Law, and Medicine.

For *girls and women* we have very little beyond the Medical Training at Delhi and Ludhiana and the Industrial work carried on in such institutions as the Hindu Widows' Home, Lahore, the Industrial Schools at Clarkabad, at Khashpur and Karnal. These schools are teaching girls to make stocking, pillow lace and embroidery, and so to support themselves and others. They are doing excellent work and deserve every encouragement.

But, as a whole, there is not such a great need in India for vocational training for women ; and while boys are trained to be good carpenters, mechanics, motor-drivers, and agriculturists, girls should be trained to be good wives.

Does the training in the High and Middle Primary Schools keep this sufficiently in view ?

(1) In the first place girls are to be given an education which will help them to make good homes ; emphasis must be laid on such subjects as Home Nursing, Hygiene, Child Nursing, Cooking and Needlework.

(2) Secondly, since many women are still kept in *Pardah* and must supply their own occupations and interests in their own homes, we should try to send them out from school with hobbies which will give them interests to employ the long days of a *Pardah* life. To *this* end emphasis in their education should be laid on teaching them their own vernacular—so that they can read and write easily and take pleasure in it—on teaching them English, so that their range of literature may be wider, and also on teaching them Nature Study, Gardening, Geography, Astronomy, Drawing, Painting, Handwork and Music.

(3) Thirdly, it is important that there should be religious teaching in all schools, and in Government Schools time and opportunity should be given for moral instruction—such teaching on the lives and sayings of great men and women, as will help in giving the students high ideals and good examples. “Morality” as a subject taught in schools should be made as practicable as possible.

Many people already engaged in education may agree with all these suggestions, but may be faced with the practical difficulty of not having time to fit in all the subjects in the syllabus.

Excellent courses for Home Nursing, Hygiene and Needlework instruction have been drawn up by the Domestic Science Inspector—Miss Graham—and we would all agree that what all schools now want is enough time to be able to carry out all that she suggests. A second difficulty may be the absence of a competent staff. In the ordinary Government-Inspected Schools there is a definite curriculum—a special set of books which have to be read in each class, and an examination at the end which has to be taken—the zealous student in a High or Middle School will be the one who will go steadily through the whole course—reading, marking and learning the text-books, and at the end take a high place in the School Leaving Examination. Far be it from me to condemn such industry ! But it may be that there is another way—and from many points of view a more excellent way—where examinations take a back seat and more attention is paid to general culture. There is room, then, in the Punjab for more special schools, and I believe that if some enterprising ladies were to start a school in Lahore, where these subjects could be taught, and the girls could be given a good conversational knowledge of English, they would find it meeting a real need. My suggestions for such a school are these :—

1. *The fees should be high.*—There was a time when people had almost to be bribed to send their daughters to school. That time is past. Now there is such a rush for education, especially for English education that all the schools in Lahore, at any rate, are full to overflowing, and the cry in every school is “No room : No room”. Since, then, India wants good education, let her pay for it. Some Indian parents will send their children to England where they have to pay £ 150 to £200 a year for their education, while they grumble at paying the equivalent of £38 a year in India.

2. *There should be fewer text-books in the lower classes,* and more should be done by work on the blackboard, by story-telling, and play. There is in some families a passion for text-books and I suppose every school gets letters asking what are the text-books used in Lower Primary I and II. I quote one which I have here :—

“ I think you will not kindly take me as a intermeddler on my posting you this under registered cover. The proposition told and laid therein before you is such a weighty and momentous one that without your any notion nothing and no way could be adopted nor it ought to be taken as the further progress and education of the girls is solely lying under your beneficent supervision while the girl ever busy extolling your cordial and sociable character extended to her during her recent stay with you, so she expects much more from your grateful hands, on her future lodgment—for this reason I shall feel myself rather gratified if you—to the goodness of your own heart—will apprise me of the

following post-haste—that what kind of books are wanted for her study now-a-days existing in the College for the Lower Primary classes that I may buy them for her.”

When asked what text-books are used for teaching History, Geography, Hygiene, Nature Study, Arithmetic and English Grammar to younger children I say “None,” for the teacher teaches the children from the store of knowledge in her own head and makes the lessons interesting and intelligible by stories, pictures, games, and handwork.”

For the education of Lower Primary classes, I agree with a paragraph I read in a book the other day: “Why this everlasting slavery to books? We are frightened of initiative, and cling to what we fancy is established. But it is only established because we cling to it. We are fearful of stepping out without handbooks, guide books, text-books, and the poor child’s life in school is often all books, and nothing but books”...so the important thing—the teacher—text-books may follow in her training. But in the UPPER classes I think perhaps we need *more* books, so that the students can learn to use books of reference, and may enjoy reading round a subject. When the inclination to read comes—let it not be crushed.

3. *In these Special Schools English should be taught colloquially* from the lowest classes, and it should be one of the special subjects. English is now accepted as the second language of India. Each girl should know her own vernacular well, but should also know English which will carry her where own vernacular will not. It is more useful to be able to speak a few words to an English guest in English, than to be able to read the 3rd Primer in a monotonous tone.

4. *Painting, Drawing, Modelling, and Handwork* should be taught intelligently and by some one who has artistic talent. A child who has been set down to draw a *takhti* every Saturday for two years cannot be expected to have a great interest in the Drawing lesson. Linked up with the Art teaching in the school should be the Needlework. Girls in these special schools should be taught designing, and the difference between good and bad designs. They will, then, be able to make their own designs for their fancy work. They should learn Indian Embroidery of all kinds and something should be done to cultivate their taste in clothes. The beautiful designs and patterns of the East are being replaced by the ugly shapes, designs and the cheap materials of the West. Girls should be taught in their Art and Needlework lessons to appreciate the beauty of the Sari and the *Suthan-Kurta* as the national dress, and the wearing of English “fraks” by Indian girls, should be discouraged. A *kurta* of the modern type with scalloped edges, and purple lace should be held up as an example of what not to wear and there should be as strong a campaign against scollop-itis as against conjunctivitis.

5. In these Special Schools (which in my imagination I already see springing up all over the Punjab) *Cooking shall* be considered an important subject. It will be sufficient if it is taught in the Upper Primary IV and V : each girl as she passes up through the school will have two years' teaching in cooking. How important a knowledge of cooking may be to a girl is shown by a story I heard the other day. A girl who had had an expensive College education applied for a post as a Governess in a family. She was offered £30 a year. She naturally refused, the sum being wholly inadequate, and was leaving the house, when she noticed that the lady seemed very worried about a dinner-party she was having that evening and she offered to stay and help, saying "I have had a cooking course, and can cook your dinner for you if you like." The lady gratefully accepted the offer, as her cook had gone off suddenly and left her in the lurch. The college graduate cooked the dinner. She cooked it so well that the lady next morning begged her to stay on as cook at £200 a year. Thus may a cooking course be of more monetary value than a college career.

6. In addition there should be taught (as before mentioned) Hygiene, Home Nursing and Child Nursing, Arithmetic, Geography, Indian History, General Knowledge, Nature Study and Gardening as well as their own vernacular. All these subjects will be of interest and of practical use to girls in their after lives. The girls should also be taught drill and games. If it should be objected that there is not room on the syllabus for all these subjects I can answer by showing a time-table where they are all taught as well as the optional subjects Persian, Arabic, Geometry, and Algebra and Music.

The staff of these special schools should consist of

- (1) An English lady to teach English and General Knowledge.
- (2) An Art and Needlework teacher.
- (3) A Domestic Science teacher.
- (4) A Kindergarten-trained teacher with knowledge of Nature Study, Gardening and Handwork.
- (5) An Urdu teacher.
- (6) A Hindi and Gurmukhi teacher.

On the staff, too, the aim should be to secure specialists rather than to secure B.A.'s.

The Fees being high the schools should be saved from the evils of overcrowding, and the numbers in each class should be kept below 20.

We hear rumour that Government is going to allot money to the opening of more Girls' High Schools in the Panjab, and my wish is that some of these "High Schools" may not be High Schools at all in the established meaning of the word—but may be special schools—

Mr. J. C. Chatterjee speaking of High Schools for boys says, "What are these schools leading to, what is their aim"? "Candidly speaking most of our schools exist for one main purpose—they lead to only one goal—namely, the passing of the pupils through the Matriculation Examination of the University."

It has been said of boys' schools—may it not be said of girls'!

Instead, may the ideal of girls' schools be that which is laid down by the founders of Queen Mary College :—

"The education of girls should be first and foremost womanly and pupils should only in special cases be prepared for the Matriculation of the University. The Indian ideals of self-sacrificing motherhood and simplicity of life should be held sacred, and the education given should seek in every way to guard the ideal of the Indian wife in her own home! Or as a parent puts it :—"I am sending my daughters to the College not for the purpose of passing the Matriculation, but to get practical training which will be useful to them in after life :—Hygiene—Arithmetic—Urdu—Painting—Needlework and Cooking may be taught them, and such subjects as will make them accomplished in the ordinary duties of a pardah lady."

We want in India fewer girls who have broken down in health through the strain of study, and more who are prepared to make good mothers and good homes. There is not such a need for failed B.A.'s., or even passed B.A.'s and M. A.'s, as there is for girls with good all-round training, who can teach their own special subject with interest and enthusiasm.

Let there be High Schools, but let there also be Special Schools.

I may say that I faced my subject on the first day with not a single idea in my head or a single spark of enthusiasm, but I am now so worked up that I feel that special schools for girls' are to be a most important feature of the Education of Girls in the Panjab.

ORIENTAL SEWING.

By MISS KHADJAH BEGUM FERROZ-UD-DIN, M.A., M.O.L.

Sewing is a plain needlework which owes its origin to absolute necessity. As soon as textiles are needed for covering and clothing the means are invented for drawing the cut edges together, and for preventing the fraying where the material is lacerated by the shaping process. Hence the "seam," the "hem" and all the forms of stitches that bind and plait. These necessary stitches constitute plain needlework and are closely followed by decorative stitches, which in gradation cover the space between the plain needlework and embroidery. The "seam" is one of the first human successful efforts to conquer difficulties. A piece of a string or a band may be helpful in keeping together several loose things, but by means of the seam, small things actually become large ones. When the world was in its infancy, a full grown man could cover his body with a garment made of the skin of many small animals by means of seams. Acting on the principle of making a virtue of necessity and adorning the very hard facts of life seams became an important vehicle of ornament. Every long seam is a suggestion. The fringe lends itself to the tassel and the shaped seam suggests a pattern; up stitches are needed for binding the web and, before she is aware of it, the worker finds herself adorning, embroidering, and the craft enters the outskirts of the region of art. There is very little mention of plain needlework even in the medieval writings and the only instances which come to our notice are those of the linen worked for some honourable purpose as a votive offering in some place of worship or as a gift to some friend and then it was generally embroidered or stitched in some fancy fashion. Before proceeding further, I wish to point out that I shall frequently speak of needlework as an art and not as a craft, because like any other æsthetic art it is intended to appeal to the sense of beauty rather than imagination. The needlework designer is essentially required to be an artist without being a poet in whom the flight of imagination is the highest ideal. Some writers admitting it to be an art, but refusing it its due position regard it as a branch of painting. But the fact is, that it is the mother art of painting and sculpture instead of being their offspring. Painting is the art of colour, sculpture is that of form; but embroidery has a more important duty, i. e., the art of clothing forms. It is a work which requires the artist's patience and industry. It needs sedentary life and thus from its very nature is essentially the woman's art.

Sewing has been, ever since its origin, the special privilege of women. In the numerous ancient histories and story books the typical woman introduced to us is the one plying her needle. The woman of the house has always been strong to fulfil her part in this civilising influence with the implement which custom has

awarded to her. The history of domestic embroidery ought to be looked upon as an important factor in the humanizing effect of æsthetic culture. It is to be regretted that specimens of beautiful embroidery of the Orient are so mercilessly destroyed by the hand of time. In the East the various centres of this art were India, Egypt, China, Babylonia and Japan. Indian needlework and design is 4,000 years old. We would fain have a look at the skilful production of our country-women thousands of years ago, but time must take its toll, and the only remains are to be seen in the form of a little frieze in one of the Indian cases in the British Museum. It consists of a repetition of little balconies with recesses and pillars with figures in pairs, which is extremely fascinating and effective. Needlework cannot exist without pattern and design which in its turn means intention and motive. The motives underlying oriental embroidery work and even textile decorations are suggestive of intention as is evident from the names:—"ripple and silver," "sunshine and shade," "pigeon's eye" and "peacock's feather." There is another pattern of Indian gold work called "Chand Tara" figured all over with representations of heavenly bodies. The Chinese trace the history of the art of needlework as far back as 5,000 years. One cannot but wonder at the perfection of the textile manufacturers and the marvellous embroideries of the Chinese, and the design throughout their arts, with hardly a change in growth and scarcely a sign of evolution.

Then there are the Babylonian and Ninevite embroideries very carefully executed. The style of the Babylonian embroideries appear to have been naturalistic though a little conventionalized at the same time. Their veils and curtains show the mystical designs of all things on the earth and above it, including the images of heavenly bodies, but it should be kept in view that it was at a time when they had crossed their art with India. The hangings of the Tabernacle embroidered in scarlet, purple, blue and gold; the cherubim with its wings and the fringes enriched with flowers, buds, fruits and golden bells are the most conspicuous specimens of the art of needlework.

The long perspective of Egyptian art, while leading us still further back into unlimited periods, shows it changing imperceptibly. Egyptian art of needlework is perhaps the only one of which we have the most early specimens. Some of the embroideries are more than two thousand five hundred years old. But the great piece of patch work in leather, the funeral tent of an Egyptian Queen, the mother-in-law of Shishak at Boulac, exhibits the proficiency of the designer and the needlework of the eleventh century before Christ. The similarity between Indian and Egyptian early art seems to have been merely in their use of the lotus as an emblem and a constant decoration. Egypt also imitated Babylon

Amongst the arms painted on the wall of the tomb of Rameses at Thebes in Egypt is a corselet of rich stuff embroidered with lions and other devices. This corselet worked in the Babylonian style, which was greatly valued in Egypt, was presented by the Egyptian King Amasis, to the temple of Minerva at Lindos.

Among the products of Japan, embroidery occupies a most conspicuous position, and its reputation has gone far beyond the East. Indeed it is almost matchless in the world's industry. The art of embroidery has now progressed to such an extent there that even pictures are out-rivalled in some respects. This remarkable development of the art is largely due to Mr. Seaman Nishmura, at Kyoto. The origin of embroidery in Japan is as much veiled in mystery as in many other places in prehistoric times. According to history at the end of the 6th century Korea sent three girls, sewers who introduced embroidery to Japan. In the beginning of 7th century, a temple was established at Asuka, Yamato province, in which a bronze image of Buddha and an embroidered image of Buddha were dedicated. This is the first record about embroidery in Japan. In 621 the widow of prince Shotoku had two articles of embroidery made bearing the image of Buddha to show her deep grief over the death of her husband. This shows that embroidery came into Japan with the advent of Buddhist religion and its history can be traced back to the 7th century. In the early days plain thread was used and later on twisted and golden thread was adopted. There was very little demand for ornamental work and the use of embroidery was confined to the robes of dignitaries and wedding dresses. In modern times Mr. Mishimura has brought about a great change by the improvement he has effected in the art of embroidery. He has taken care to develop the art in such a way so as to suit modern tastes, both in the country and abroad.

In the West the nunneries produced the finest work of the dark middle ages. The teaching of the nuns inaugurated workrooms within the palaces and castles, where young girls, whether royal, noble or gentle were trained in embroidery as an accomplishment and a household duty. But it is really sad to learn that only very few specimens of the skill of those who organised and developed this art in the remote past have escaped destruction. The reason why so little survives of ancient embroidery is self-evident. Woollen stuffs and threads decay quickly and the moths corrupt them. The only ancient bits that remain have been preserved by the embalming process, which has kept the contents of tombs from becoming dust.

The work-woman and her work are gone, but there is the needle, proof positive that the art has been in existence for long centuries.

Whether in the East or the West, the woman of the house has adorned not only herself, but she has hung the walls, the seats,

the bed, and the tables with her beautiful creations. Homer's women were all artists with the needle. Hecuba's wardrobe is thus described :

The Phrygian queen to her rich wardrobe went,
Where treasured odours breathed a costly scent ;
There by the vestures of no vulgar art
Sidonian maids embroidered every part.

The goddess Pulla Athene patronized the art of the embroidery and the holy peplos which robed her state, and was renewed every year, was embroidered by maidens under the superintendence of a priestess. But in spite of the perfection reached by Western women in this art one fact is too true to be denied that embroidery was imported from the civilised East. Europe had been fertilized with taste in this art from the Orient by three different routes :

- (a) Through Egypt, whence it was conveyed by Phoenician merchants and Etruscans.
- (b) Through the Slavonian route.
- (c) Through the Byzantine empire.

But the law of give and take works so silently and resolutely that its effects are hardly perceived till an unprejudiced observer with his searching glance points out the change in the different stages of the history, art and literature of a nation.

India is known for its conservatism and the spirit of its decorative art is naturally considered to be that of a crystallised tradition, for its type has remained almost unaltered, since the Aryan genius culminated in the Ramayana and Mahabharata. Yet the truth remains, the elegant spiritual art of India was constantly renewed by the kindred influence of Persia and the Renaissance of Europe. And at last we have reached a stage when in the absence of ancient materials and dyes the beauty of Indian embroideries is reduced to mere mannerism, which is more dangerous to art than the havoc wrought by war.

Even in these degenerate days when all Indian art is at its lowest ebb, particles of gold dust still shine in the sand. The embroidery work of the Brohis in Baluchistan, of the Waziris and Kakars, specimens of which can be seen in the Lahore Museum, still stands a model of its pristine beauty. The embroidery of Kashmir on silk and wool is of historical and universal fame. The Kashmir embroidered shawl trade is of the remotest antiquity and importance, but it is now being checked by the use of French designs and magenta dyes in the manufactures of the fabrics. The ornamentation of the shawls is distinguished by various names such as the "Hashia," the "Pala", the "Zangir" and the "Kunjbuta."

Some shawls of the 19th century were worked with a map of the city of Srinagar, representing the streets, houses, gardens and temples with the people walking about among them, others represented the conventional Persian and Kashmir wildernesses of flowers with birds of lovely bright plumage. Muslin is embroidered at Dacca, Patna, and Delhi. Rich embroidery is also produced by Hyderabad and Sindh. The embroidery of Nauanagar and Kathiawar resembles that of Caspian. Gold thread embroidery of Isphahan is very common at Peshawar. The embroidered caps of Peshawar are also very much valued. There is a good deal of embroidery work done in Dera Ismail Khan and Hazara district, and the Phulkaris of Punjab are very well known.

Besides embroidery various other branches of work can be classified under the heading of sewing, such as lace-making, knitting, and drawn-thread work. From the earliest times the art of lace-making has been so mixed up with that of needlework, that it is impossible to enter upon the one without naming the other.

The origin of hand-made lace is obscure. So far the idea most prevalent is that the inhabitants of Flanders and Italy were the inventors of this class of sewing, though it is very difficult to be positive about anything when the labours of researchers bring to view new ideas every now and then, which falsify all previous theories.

Again both Italy and Flanders claim precedence in the invention, but some writers have proved that bobbin lace was known in Venice long before it was learnt by women in Flanders. Laces are trimmings in the sense of being decorative edges to more solid materials and help to give the grace of mystery to the object they veil. Of course they cannot be included in the high art, as they have more affinity with grace and refinement than with æsthetic culture. Some attempts have already been made to trace lace-making to oriental sources and there is nothing astonishing in this as Venice in Italy was peculiarly fitted by her position to transmit Oriental influences. The Venetians traded with India from very early times and even had a consul at Siam in 1390. Venice distributed metal work, silk, cloth of gold, which came to her through Constantinople to the rest of Europe. It was in Venice that trimming and embroidery of white linen came into fashion. The design in the furniture which was so much in favour in the West, even so late as the 16th century shows the obvious influence of Eastern art and in many cases the patterns have been directly taken from Arab sources. The same influence shows itself in the stuff embroidery, metal work, and other such things of which the industries were naturally directly affected by the importation of Eastern models and Eastern methods. It is thus quite probable that lace-making, like drawn thread work, was derived from the Orient. But the main objection

to this idea is that no ancient specimens, and no modern continuation of such work is to be found in the East.

Even in the West no definite date can be assigned to the origin of lace-making. The earliest mention of laces by name is to be found in the lines of the Poet Laureate Skelton in 1460—

When that the tapets and carpets were layed

Whereon this lady softly might rest,

The sampler to sew on, the laces to embroid.

Whatever the date and place of the origin of lace, one thing is clear, that in India it is now considered to be the product of the West.

Drawn Thread Work was known in Egypt in the earliest times, and examples can be seen in the mummy clothes in the British Museum. How much we would like to see them! but they are, like many other specimens of rare ancient art, beyond the reach of everybody. From Egypt it went to Persia and thence the Venetian merchants carried it through Constantinople to their native land. During the 15th century Venetian linens for fine towelling and napery in general were very much in favour. The same motives of oriental design, the same stars and crosses were first applied to linen ornamentation in Venice and it is from Persian drawn thread work with whipped stitches that the Italian art of drawing out threads and stitching over them was derived. From Italy it spread all over Europe and in the 19th and 20th centuries was brought to us from there.

The other important branch of sewing is knitting. The origin of forming a continuous fabric by hand knitting is shrouded in mystery. Ancient history gives a little clue from the records of knotting in the making of fishing nets, and there is a probability that elementary knitting was also known. In confirmation of this, several passages in the ancient classics referring to textile fabrics seem to indicate that knitting rather than weaving was implied. But there appears no separate term for knitting in the old languages and this leads us to the interpretation that the arts of weaving and knitting were confused by less keen historians. The Greek historians are of opinion that knitting was first practised in India and in the 4th century B. C. it was taken from here by the men in the retinue of Alexander. Still whenever the art of hand knitting was invented, the name of the originator is unknown, and thus, like so many of our primitive arts, it can only claim nonentity as the name of its true inventor.

The derivation of the modern word knitting is from the Saxon 'Critton,' which means the making of a fabric by hand. The first allusion made to it by historians in England is in 1492. But the art did not begin or flourish there. Wool is the product of the

pastures of hilly countries and it would be only too true to say that knitting must have been practised in the lowlands of Scotland. The next reference is in an old grammar of King Henry VIII's daughter published in 1530, wherein the verb 'to knit' is found.

It soon developed into a regular work for the poor and a relaxation or pastime for the wealthy. The art became so popular and made such wonderful progress that in the course of one hundred years a mechanical contrivance, which would make a knitting fabric, was invented. This machine increased the production at least ten-fold, and as machinery goes quicker, the industry as far as hand knitting was concerned fell off. The war period witnessed a great revival of hand knitting which arose from the desire to send comforts to soldier relatives. Knitting is a soothing tonic and there is the pleasure and satisfaction of producing some thing directly useful without much trouble. Unlike embroidery it does not tire the eyes. One can enjoy talk with friends, or walk about without any interruption in the work. It is to be noted here that the term hosiery has undergone a great change. In its origin it had reference chiefly to articles of foot wear and it was in that case that the utility of the knitted stitch was recognised. The feet form a delicately susceptible part of the anatomy of the body and require thorough care in fabric selection. To have foot wear in the woven texture is unthinkable if from no other reason than the seams which would be necessary and to have one of these located at the heel or along the sole of the foot would render the wearer unable to walk in a very short time. Moreover the perspiration is so profuse at the pedal extremities that the knitted texture above all is adopted to that sort of interaction between skin and fabric which is required for the absorption.

This shows that like the sewing of clothes knitting was an invention of necessity. But this seems to be the necessity of the West more than that of Indian plains as here the people hardly wore shoes. Still the problem remains unsolved as the men in the train of Alexander the Great, stand witness to the fact that people of India wore knitted shirts and that was fifteen centuries before knitting was known in Europe.

So far I have dealt with the history of the main branches of sewing in brief, and have also proved that the art is specially suited to women, as it requires her patience, her fine taste, and her delicate touch for its accomplishment. A woman who is not well acquainted with the art cannot be called perfect, no matter how well educated, how highly cultured she is. For a woman to aim at mere intellectual development of her talents is one-sided education. It is thus an absolute necessity that sewing should be taught in the schools. Some people work under a misapprehension that girls need not waste their precious time over these

ordinary things as they can very easily learn them in the homes. But they forget that as by holding the paint brushes in the hand and putting lumps of colour on paper one cannot become a painter, nor by taking a chisel and producing mis-shapen things of rough stones one can aspire to the dignity of a sculptor, exactly in the same way a woman by putting together a few pieces of cloth haphazardly cannot be called an expert in the art of needlework. It is a work which requires a thorough training as in every other art. It is thus absolutely essential that sewing should be considered an important subject in all the girl schools and as much attention should be paid to it as to Mathematics, Science, General Knowledge, and Languages. It should be kept in view by all those interested in the education of women that want of due attention to domestic art and science in the institutions is a great hindrance in the mental uplift of women. People feel very much disappointed with the education which devotes full time and full attention to the intellectual development and omits the most important requirements in life—the practical training.

Up till the Middle School Examination all that the girls are expected to know, nay to be more accurate, expected to show, are a pair of socks and a hand-made shirt, which is more often the work of other persons than the examinees. The school must lay a special emphasis on the girls being able to cut all kinds of garments worn by the educative class. They must of course know how to sew neatly, but as cutting is much more difficult than sewing it deserves special attention. The girls must be well-versed in the cutting and sewing of such garments as coats, pants, waistcoats, shirts, pyjamas, blouses, all the underwear and children's clothes.

The other most important branch, but the most neglected, is mending. It may not be difficult to put a patch to an ordinary torn garment but the mending of costly dresses and putting new collars to coats requires great skill. The necessity of teaching how to darn knitted footwear is very urgent, to inculcate tidy habits without incurring undue expenses. Girls are generally very much interested in embroidery and would develop taste in it without much external pressure. Phulkaris are a nice embroidery for hangings and tapestry. Besides that, more modern embroideries suited to the age in which we live should be taught. Human nature has a tendency to dislike the old fashions whether in art, education, or living. The change if healthy, systematic and based on a fine taste is welcomed, for if the art had not its fashions the world would be overwhelmed with shabby rags. That which our grandmothers worked or wore is an object for affectionate sentiment, and the best specimens, are worthy of preservation and imitations, but times are changed and with it the needs and the taste. Then there is the economic question. Everything is so expensive, the needs of society are increasing with such rapidity that it would not be possible to make both

ends meet, if women are not regularly trained to perfection in the art of beautiful sewing.

At the same time the school authorities must take care that children under eight are not made to do fine embroidery work as it effects their eyesight and health. It would be much better if they are to be taught knitting and lace-making at that age. They may also sew simple clothes cut by the bigger girls. The value of time and the necessity of cleanliness should be constantly impressed upon the minds of young children.

In some of the schools in the infant classes, children when they first begin knitting or sewing are forced to do and undo the same piece over and over again, with the result that children whose fancy is naturally very quickly satisfied lose interest in the work and become indolent and untidy. On the contrary if these little ones are given the idea that things they were making would be put to some use even if they were enough to clad a little doll, they would as a matter of fact work more zealously and would feel ashamed to dirty their production. This work of knitting, lace making, darning, sewing, mending, cutting of clothes, and embroidery should go on stage by stage systematically and regularly right up to the Matriculation. It is true in the higher classes there is very little time, the girls having so much to do for their examination in the other subjects. But if the school authorities are particular about the welfare of the girls, and have a real interest in their later life, they can very easily fix two hours a week for this indispensable subject, *i. e.*, sewing. Besides being useful practically, sewing is a great moral training. Create her interest in sewing and the laziest girl will become the most useful person. It inculcates serious habits and teaches patience and precision. Many of the girls who do not have sufficient means to go up for higher education or do not possess good brains, can very easily earn an honourable living by this art in adverse circumstances. It is a long and seriously felt want and those who would raise their voices in the matter would be the true friends and sincere well-wishers of Indian womenfolk and India.

HEALTH OF SCHOOL GIRLS IN THE PUNJAB.

BY MRS. DAGMAR CURJEL WILSON, M. D. (GLASGOW), D.P.H.
(CAMB).

I propose briefly to summarize my conclusions regarding school girls' health hoping that the points raised may lead to discussion and criticism and to furthering of the work through the agency of this meeting.

First, I do not think it necessary before such a meeting to point out the reasons which would lead one to think that something

more might be done towards improving school girls' health in the Punjab, because the subject would not have been brought up at this meeting if you did not agree the need was present.

In my opinion improvement may be brought about in three ways, which arise one out of the other.

I. Starting with teachers. I hope you won't mind if I start with the training of teachers in hygiene and health matters. Please don't take my remarks too personally and if I seem to exaggerate, pardon me. It is perhaps only by over-emphasis that one seems to be able to bring one's point home in a short summary. I have come to the conclusion that neither the average man nor woman teacher has learnt practical hygiene; from that I mean that matters relating to personal and community health have not been put before them in a practical way. I do not believe that mere text-book teaching and illustration helps much in this matter. I know that I myself needed to learn my public health work practically, and I do not see why those of our lay brethren who have not gone through a preliminary medical course should be expected to find book knowledge of hygiene any easier. Hygiene courses at normal schools should include practical demonstration; for example:—personal visits to discover mosquito breeding places, (they are not very far to seek in the neighbourhood of most bungalows!) finding out the stages of mosquito development and trying preventive methods. Search for flies, the habits of flies and fly breeding in relation to dysentery and intestinal disease. The disposal of household refuse, rat breeding, disinfection from rats, preventive measures such as inoculation, disinfection for plague, how these are carried out locally, how the health authorities can be got at, and what help may be asked from them.

Such methods are taken up in the training of girls who are not necessarily of a high standard education, as health visitors, and I do not see why they should not also be demonstrated to women teachers. The lecturer should be a medical man or woman of practical public health experience. I believe that a teacher to whom public health has been made a living matter in this way and who has been told about the most interesting struggles to-day being carried out by the Public Health Department in the Punjab in various localities in the fight against infectious diseases, would become really interested in the subject, and could not fail to make hygiene of vital interest to her pupils. May I give examples?

I was present recently at a lecture given in a high school with the malaria slides jointly issued by the Red Cross and Health Department. These slides tell a very simple story of the cause of malaria and its prevention. The lecturer was a learned assistant at that high school. It needed some self-control to sit still and hear the slides all wrongly explained. It was very obvious

that particular lecturers had never personally gone hunting for developing mosquitoes. As a contrast I would like to mention the interest with which children from some of the poorest classes, "half-timers" at the Cawnpore mills, in answer to my questions, eagerly told me of the various stages in the life cycle of mosquitoes, pulled me along to show me where mosquitoes had been found developing in the neighbourhood of the workers' model village, and told me what measures under the direction of their teacher they had taken in their scanty leisure hours to stop this harmful development.

II. Granted a teacher interested in practical hygiene, what can she do in her school ?

(a) She can care for the hygiene of her pupils while at work, consider attitude, light, ventilation, making the best of the rooms at her disposal, not forgetting the importance of rest intervals, physical exercise and organisation of games, nor the sanitary care of the premises.

(b) She can see that the surroundings of her school are kept in the sanitary condition. I know this will not be easy, but if she has the knowledge I have outlined in I, she will know what ought to be done, and who are the proper authorities to whom she can appeal in getting this carried out.

(c) Being herself practically interested in health matters, she will be able to give practical instruction to her pupils, and make the subject one of real interest to them. May I plead for more use being made by teachers of the material for health teaching which is even now available ? On application by a teacher to the District Health Officer it should be possible for her to arrange to have a health lecture given to her pupils. If she is not herself able to manage a lantern the Health Officer could arrange the lecture for her, operating the lantern so that the slides are seen, if necessary, on the reverse side of the screen under purdah conditions. Very good simple stories are available for telling to children about simple infectious diseases, in connection with these lectures and I have heard these slides explained in a very amusing and entertaining manner. The lectures can either be given by the District Health Officer or by the teacher herself, for a "book of words" is available. The loan of the lantern and slides should be arranged for, free of cost, by the District Health Officer.

Now that the Punjab Health Week has become a regular function in many localities I think more use might be made of the health exhibition, by preparing and interesting the school pupils in the matter before the actual week.

Few schools have yet a corps of Indian Girl Guides. Where these are formed, practical hygiene should be made an important

feature of their work, in some form or the other. How to keep the house clean and free from dangerous insects, how to feed and care for young children, the importance of personal hygiene, etc.

III. School Medical Inspection.—With a teacher taught as in I and pupils taught as in II, sooner or later medical school inspection should necessarily follow. I do not think just because the difficulties in connection with medical school inspection of Indian school girls are considerable, that we are justified in evading the matter. The difficulties which I found are —

(a) *The absence of any real data to help in drawing up forms.*—We know what is required by the English School Medical Service and what is adopted in various American States, from the most excellent official publications available for any one interested in the larger libraries. A study of the annual reports of various Indian Provinces show that but little progress, however, has been made in school medical inspection in India. It is worth reading these reports as well, because they supply us with some invaluable “*don'ts*.” Chiefly I think “*don't attempt too much*” and “*don't whitewash your results*.” Still I do think some attempt now might be made to introduce medical school inspection in the more advanced girls' schools in this province. We have a certain amount of information available from the records kept by various missionary societies in their girls' boarding schools.

(b) *Difficulties regarding Staff.*—The simplest form of scheme for medical inspection would, I think, be a well-qualified visiting woman medical officer working in conjunction with the local woman doctor attached to a neighbouring civil hospital. Very simple facts could be taught at first regarding general development, nutrition, eyes, ears, nose, etc. Later perhaps examination of heart, lungs, etc. But an attempt should be made that whatever work is undertaken should be carried out as accurately as possible, so that the facts ascertained could be collected and used to indicate lines of further development. I think it is important that an attempt should be made to explain the results of this examination to the parents, *i. e.*, it would be better to take one class in school, say the entrance class and do the work properly, rather than obtain inaccurate records of a large number. This work should be carried out in school time and should not involve extra work for the already heavily-worked teachers. In conjunction with school medical inspection I think we ought to push “*father-craft*.” In other countries and even in other parts of India, more and more it is being realised that in order to get real improvement in the health of a family it is necessary to interest the more educated members and lectures are held, discussions, meetings, competitions even, are arranged for *fathers* in subjects relating to the health and general welfare of their children. I think the District Health Officer might well be asked to give such a lecture in any locality where school authorities are themselves taking up the question of their pupils' health.

I am sure you yourselves will have many practical suggestions to offer, and hope the outline I have given may serve as an introduction to the experience of other workers.

INSPECTION.

By Miss V. G. BHAN, B. A.,

Assistant Inspectress.

I want to say quite frankly at the outset that I have had very little experience of Inspection work except as an Assistant so my paper will be more or less the tale of a wanderer's adventures in some of the villages in the Punjab.

To encourage and promote girls' education and supply efficient supervision and foster its growth an Inspectress was appointed in 1887. Before this Mrs. Flora Annie Steele, the novelist and wife of a Deputy Commissioner, started and inspected girls' schools in her husband's districts. The Province could not have been more fortunate than in its first Inspectress, Miss Francis, who did such splendid and devoted work and established a tradition which we all try to live up to. Then in 1905 Eastern and Western Circles were established and now after a period of divisions into spheres of work like those of Inspectors we are back at circles and have three circles, Central, Western, and the Eastern. The former two circles comprise ten districts each while the Eastern Circle is formed of the remaining nine districts.

The Eastern and the Western Circles are in charge of Inspectresses and the Deputy Directress in addition to all her other heavy duties looks after the Central Circle herself. Each Circle has three Assistant Inspectresses and to each of them are allotted three districts. Of the remaining two districts in which touring is both expensive and difficult one is under the direct charge of the Deputy Directress, and the other of the Inspectress of the Western Circle.

It will be seen that the women's branch of the Education Department differs materially in organisation from the men's branch. In the latter there is an Inspector at the head of each of the five divisions, designated the Divisional Inspector, who has a personal Assistant, the Deputy Inspector. Besides, a Divisional Inspector has an Assistant in each district—the District Inspector, who in his turn has as many helpers as there are tahsils. The latter are the Assistant District Inspectors.

That the separation of the women's branch has been of a distinct advantage to female education does not seem to have been fully realized. The District Inspector and his staff on account of the Pardah system and the prevailing social customs was naturally handicapped in his work so far as the girls' schools under his charge was concerned.

An Assistant Inspectress is in charge of about 150 primary schools and she is expected to inspect as many of them as she possibly can twice in the year, and to submit her report about the working of each district separately. Her work lies chiefly in the country as the majority of schools under her charge are situated in villages.

To reach these schools is sometimes a problem. The first thing to be done is to secure accommodation in some central Rest House or a dak bungalow, from which schools within a certain radius can conveniently be visited. This is not always an easy task. The next difficulty to overcome is to find some sort of conveyance to take her to these schools. The big cities may boast of their motor cars and lorries, but here in some of the villages one should consider oneself fortunate if a *tum-tum* or an *ekka* even can be hired. The journey sometimes lies over wild, unbroken country or over hilly tracks with only footpaths to serve as land marks. In such cases you have to make your choice between a walk of 10 miles or so or ride using a man's saddle and occasionally not even that. If unfortunately a monsoon stream bars your way, you had better wade through it, if you do not like being carried on a *charpoy*. If a stretch of 2 or 3 miles of a bed of sand has to be traversed you are not only expected to walk this distance but to lend a helping hand to move along your *tum-tum*. If in the event of an accident the return journey cannot be completed the same day, put on a smiling face and be content to make yourself comfortable for the night in the school building.

It is not uncommon to find the school situated in the centre of a village in a rented building from which light and air seem to have been deliberately excluded. The laws of hygiene are hardly known. The same building may serve as a school room in the day time and give shelter to cattle at night, or both of them may stay side by side. Your coming has already been announced and you need not be surprised to find women and children gathered together out of mere curiosity to see you. They even lie flat on the roof to look through the gratings and look hard the whole time. Their candour is really refreshing. While you are conducting the Inspection you can hear them discuss your face, your hair, and the details of your dress. An Assistant Inspectress turns these gatherings to good account by giving these women a short homily on the benefits of education and thus tries to make the school popular.

These simple-hearted women hardly know the distinction between an Assistant Inspectress and a lady doctor. Many a time a woman rushes up to you in the midst of your work with a baby and implores you to do some thing for her and turns back with disappointment and wonder that you have no simple remedies to suggest.

It is fortunate if you do not wear spectacles, otherwise be sure that some old lady, almost blind, will come up to you and ask you for your pair of spectacles. She is too feeble to undertake the journey to a big city. She tells you that you will be returning to it soon and can easily buy a new pair for yourself.

A village school generally is a one mistress school ; a second mistress is only allowed if the number of girls exceeds 40. The mistress herself has passed the primary school only and sometimes not even that. Many of them have hardly been out of their village or seen an up-to-date school. They have neither any means nor facilities to improve their knowledge in any way. A great deal of sympathy and patience is required to bring these schools to a proper level. Their standard varies a good deal. An Assistant Inspectress takes each school as it is and tries to make it take a step forward at each visit, as she knows that a long jump would be too much for the mistress. Last year in a school in which Geography was not being taught, I gave a model lesson. When I next visited it, the mistress told me cheerfully that she had not only mastered the subject herself, but that her girls were well up in it. She asked a third standard girl to start off and the wee mite in one breath began to name the villages of her district and there was a smile of satisfaction on the face of the mistress.

To correct the teaching methods of a mistress is the chief concern of an Assistant Inspectress. This is done by a friendly talk and by giving model lessons for her benefit. The mistress is slow to learn but by hammering in your points at each visit the effect is eventually reflected in the children.

Several of these dear mistresses represent the old school. They would tell you frankly in their own delightful manner to let them live in peace as there will be time enough to introduce the new "fashions" after they are gone and young persons take their place. To show how simple-hearted these mistresses are I will tell you what happened not long ago. In a certain village the teacher of a school thought the Assistant Inspectress might be coming. The mistress all day long kept inquiring from the boys' school if she had come. Late in the evening she gave up all hopes and dismissed the classes. No sooner had she done so than a mischievous boy, with a blanket as a coat turned up at the school. The poor woman made the best excuse she could, and hurriedly tried to collect the children. The supposed Inspectress found fault with the registers and her teaching work. The woman was on the verge of tears and great was her relief and joy to find afterwards that a boyish prank had been practised on her.

The school life of a child begins at the age of 5 or 6 years. How often one comes across mothers who are anxious to get for their children, who are hardly of 10 or 11 years of age, the *Surkari Sanad* by which they mean the Primary Certificate and to

which they attach a great value. The child may be yet in the 4th or even in the 3rd class. The mother pleads as the child is considered to be old enough to get married or to stay at home to look after her younger brothers and sisters. After much persuasion the mother reluctantly gives in and lets the child remain at school simply to be able to obtain the much prized certificate.

In spite of all this one feels that girl's education is rapidly progressing. The demand for higher education is increasing.

With steady steps the Department is taking the light of education to the remotest corners of the Province. New schools are being established and the old ones are being gradually worked up to a higher standard. A well conceived policy is being pursued and pushed through as rapidly as circumstances permit. The whole outlook is rapidly though silently undergoing a change, prejudice and ignorance is being swept away, and a desire for knowledge has been created. If there is need for anything to-day, it is for more trained teachers and for more and more well-equipped and well-situated school rooms.

HIGHER EDUCATION FOR GIRLS.

By MISS G. HARRISON, B. A.

I propose to make some general remarks on education and then to pass on to professions for which woman are specially fitted and say a word about each.

The first thing I want to say is that higher education is not separate from or in any way different from the rest of education. Whatever ideals guide us in education generally should guide us to the end. We often think of education as a process of building—it is a handy and easy metaphor. We try to build up the child's character and his knowledge and mould him to fit in his place in the great fabric of the state. Now there are buildings of many kinds from simple little huts to the stately palaces, but the one thing every building must have is a firm foundation and those of us who are engaged in college teaching are trying to finish with a certain degree of beauty, ornament and polish a building of which the foundations have been laid in schools so what I want to impress on any school teachers here is that we are relying on you, and the colleges cannot make a good job of their work unless the schools have made a good one of theirs. If in the college course we find the foundations giving way and we have to go back and relay them we have not time to erect a building of any complexity or beauty but we have to rush up the plainest and quickest we can.

Now I want to mention one or two places where the foundations give way.

GEOGRAPHY.

Girls in the Intermediate classes do not know where to find the different countries of Europe, they apparently know nothing of the British Isles, they cannot draw a map of anything from memory and their copied maps are crude and untidy. Now the teaching of Geography is mostly done in the middle classes before the difficulty of language arises. That is to say it is learnt in the vernacular, and at a time when memory is most retentive and when things such as map drawing and map modelling, employment for the hands, give most pleasure, so I think there is no reason why a girl should not have a clear idea of the countries of the world, and be able to find places on a map. Since the exhibition was opened I have been pleased to see many excellent models of India, many of the Punjab, but I must still put in a plea for Europe. The Dutch and the French have had a share in India's history and I think it only reasonable that their general features should be known.

GRAMMAR.

Now I suppose grammar is considered a dull subject or a good deal of drudgery has to be done in connection with it, but I maintain that there is far less actual grammar to learn in English than in any other language and that the place to learn it is in school when the child first begins to study English. It is far less effort to make the child learn verb forms right at once than to let her pick up habits of saying, I have went—on the station—which will take months of drill to eradicate later. I do not want to burden the child with technical terms but she must know the correct form of the ordinary common verbs. She must understand that plurals are formed mainly by sound and that some nouns do not take *es* just to annoy but because you cannot say them without making an extra syllable. Still more important as there are no inflections to worry her, she must grasp the principles of order in English. She must understand the common sense plan of mentioning the thing first about which you are going to speak and then explaining what act the thing or person is performing. She must realise in fact the difference between saying "The horse pulls the cart," and "the cart pulls the horse." The same applies to the active and passive voice. It is not a trick but a pleasing way of expressing the same thought in a totally different form.

English is to my mind one of the easiest languages to learn and I have had a shot at six others, granted you get help with pronunciation but it is useless to try and help a girl to appreciate beauty of style and phrase if she is still in the Intermediate stage breathing with the language as a sort of heavy fog or blanket which will not let her thoughts emerge.

Lastly arithmetic—and here I tread delicately, being myself no mathematician. But I have heard bitter complaints of girls

who divide by 10 by long division, who make mountainous and unwieldy fractions when they might be dealing with whole numbers and who make decimal points skip like young rams.

The Science course for Intermediate is very stiff, and very long. The students must run to get through it in two years. So I do beseech any who are teachers here not to send them to College uncertainly staggering upon crutches.

Now I pass on to professions. We hear a great deal of professions for women now-a-days and one of the problems for ever cropping up in modern novels is how a woman may reconcile the claims of home and the claims of art or business or whatever it is for which she has shown a special aptitude. There was an American lady in Europe this last summer at a meeting in Belgium of the World-federation of University women, who claimed to have brought up four children and to have been the right hand man in her husband's business the whole time without detriment to the children or the business. That is as may be. There are exceptional women who make excellent lawyers or politicians but I consider that as a general rule for a married woman the first call is that of home, particularly when the children are below ten. Then it is that the principles of self-control—of consideration for others—of the difference between things which are yours, and things which are not yours—of obedience—of right doing and wrong doing have to be taught. These principles cannot be taught unless you have first learnt them yourself and that is where the hostels attached to schools are most useful. I find Indian girls very casual and what I should call "undisciplined". They expect to come to meals whenever they like—they leave chairs, bats and balls whenever they have used them—not to mention orange peel and banana skins. All this means extra and unnecessary work for the servants, and a girl will never run a tidy and comfortable home if she has no sense of time or place. That is one of the many lessons to be learned from living with other girls, and it is far more important than facts from books, and I am sure every one who has to do with boarders has realised what a tremendous opportunity it affords of teaching by example all the things that make for law and order in life. Parents often used to tell me when I still had High classes that the most important thing a girl should learn was cooking. I ventured to disagree profoundly and always told them so. Cooking can be done by a person of little skill judging by my own experience and I regret to say of little character, but the making of a home and the upbringing of children is a task making the greatest demands on all faculties and testing all one's powers, and yet it is learnt only by practising all manner of little penances day by day and there is unfortunately no course defined. Some can never say we have finished the course. At the risk of boring you I will here read a short piece of Ruskin which is still very much to the point :

" But the woman's power is for rule, nor for battle, and her intellect is not for invention or creation, but for

sweet ordering, arrangement, and decision. She sees the qualities of things, their claims and their places. Her great function is Praise : she enters into no contest, but infallibly adjudges the crown of contest. By her office, and place, she is protected from all danger and temptation. The man, in his rough work in the open world, must encounter all peril and trial : to him, therefore, must be the failure, the offence, the inevitable error : often he must be wounded, or subdued ; often misled ; and always hardened. But he guards the woman from all this ; within his house, as ruled by her, unless she herself has sought it, need enter no danger, no temptation, no cause of error or offence. This is the true nature of home—it is the place of Peace; the shelter, not only from all injury, but from all terror, doubt and division. In so far as it is not this, it is not home; so far as the anxieties of the outer life penetrate into it, and the inconsistently-minded, unknown, unloved, or hostile society of the outer world is allowed by either husband or wife to cross the threshold, it ceases to be home ; it is then only a part of that outer world which you have roofed over, and lighted fire in."

" I believe, then, with this exception, that a girl's education should be nearly, in its course and material of study, the same as a boy's ; but quite differently directed. A woman in any rank of life, ought to know whatever her husband is likely to know, but to know it in a different way. His command of it should be foundational and progressive ; hers, general and accomplished for daily and helpful use. Not but that it would often be wiser in men to learn things in a womanly sort of way, for present use, and to seek for the discipline and training of their mental powers in such branches of study as will be afterwards fitted for social service ; but, speaking broadly, a man ought to know any language or science he learns, thoroughly—while a woman ought to know the same language or science, only so far as may enable her to sympathise in her husband's pleasures, and in those of his best friends.

Yet, to observe, with exquisite accuracy as far as she reaches. There is a wide difference between elementary knowledge and superficial knowledge—between a firm beginning, and an infirm attempt at compassing. A woman may always help her husband by what she knows, however little ; by what she half-knows, mis-knows, she will only tease him.

And indeed, if there were to be any difference between a girl's education and a boy's, I should say that of the two the girl should be earlier led, as her intellect ripens faster, into deep and serious subjects: and that her range of literature should be not more, but less frivolous; calculated to add the qualities, patience and seriousness to her natural poignancy of thought and quickness of wit; and also to keep her in a lofty and pure element of thought."

Now I pass on to teaching and I do not propose to say very much about that. I want to point out that an Indian woman teacher occupies a unique position in the world—that of being paid about three times as much as men in similar work with the same qualifications. Please do not think I disapprove of this. I don't but I think it wants living up to. It means that women teachers in India are a picked body—they have a good deal of power in their hands. They are at present conscious of their importance but I think they might perhaps bind themselves together more and stimulate each other's interest in literature, art, politics, modern movements of all sorts, and particularly by intercourse keep the ideal of service ever before their eyes. In this connection I should like to say a word about the League of Nations' work. It has been suggested that the League programme should be kept specially before all schools in England and I think that might be done in India also. A child is naturally a very friendly soul and a good deal may be done towards building up an atmosphere of world peace by instilling into them the idea of their country being one among others and having a special task to accomplish in the world in friendly co-operation with the rest of the world. In this way the teacher may do a little towards preserving the world from the horrors of war, looking nearer home in India from the very real horror of communal strife. It seems to me impossible that the comradeship existing between all sects and classes in schools should not bear fruit in later life.

I now pass on to the third profession about which I wish to speak. I have purposely chosen those in which women will always have plenty of scope and in which she can never be seriously rivalled—the profession of motherhood, the profession of teaching and lastly the profession of sick-nursing. I had two girls with me a year or two back who were both widows and both older than the usual High school girls. Being widows life did not hold out much enjoyment for them and they had an earnest and pathetic desire to improve themselves and find some niche in life into which they could fit. I must explain further that they were not specially gifted intellectually and it was obvious to me that they would not be able to pass the Matriculation examination. They were a problem. However the Lady Reading Hospital and training school for nurses was then opened in Simla and I was able to persuade one of these girls to go there. She got on extraordinarily

well, showed great sympathy with the patients and thoroughness in mere care of them and I hope and believe that she has thus found work which will satisfy her and be of real service in the country. This seems an example which might well be followed by other girls who are not intellectual enough for a college career but who desire to find work with companionship, with interest, and with security. I have been asked sometimes when suggesting this course to others what the status of the nurse will be ? and whether such work is not degrading ? I venture to think that the status of any profession depends on the people in it. If honourable women take up work of any kind, it becomes honourable work. Nurses were usually uneducated and common women in England until Florence Nightingale had the courage to show what an honourable woman could make of the profession, and others followed her—the same with doctoring. If you read any book of the 16th or 17th century you will usually find the “leech” spoken of in terms of contempt, but no professional men are more venerated than medicine practitioners of the present day. I admit it is an arduous profession, but the Director in his opening address made an appeal for work from all, and I think useful occupation is one of the royal roads to happiness. There is still among uneducated Indians a horror of hospitals. I have met it among my own servants and I think it is largely because the hospitals for women are largely staffed by Europeans or Anglo-Indians and they are afraid that their customs will not be known or respected and I think this fear would disappear if there were plenty of hospitals run entirely by Indian women.

Arising from this I want to mention also Infant Welfare work and the running of clinics for mothers and babies. You are all thoroughly familiar I am sure with the names of Miss Simon and Miss Raynor, and appreciate the work that they do in the training and inspecting of *dais*. It is not enough to approve at a distance—get your pupils to take up this work or if you have daughters get your daughters to apply for training. The Punjab Province is wonderfully ahead of other provinces in its plans for welfare work. Centres are being started everywhere, and the District Boards are being most helpful in supporting schemes and there is ample opportunity for work everywhere and especially for women of education and standing in superintending the work of the trained *dais*. This work is not showy—it is laborious—it is often uphill as the mountain of prejudice is very high but it is a calling that is concerned with the very life of the nation—it lies behind education, behind schemes of sanitary improvement, behind medical inspection of school children, behind almost everything and it is one that only women can successfully do.

I must now apologise for the didactic tone I have adopted. Speaking *ex cathedra* is a habit which also grows like every other bad habit, but believe me that when I venture to advise I speak because I mean it—and I speak to myself as much as to any one.

GIRLS' PRIMARY EDUCATION.

BY KHAN BAHADUR MAQBUL SHAH, M. A., I. E. S.

I feel very strongly on this subject and consider it of paramount importance in our province at this time. We have made great strides in men's education during the past four years or so ; indeed in some branches of men's education we have beaten all the other provinces of India, but in women's education we are lagging far behind. We had 7·28 per cent. of the male population at school last year against 1·02 per cent of the female population. We hope to attain the possible maximum in male education within the next 5 or 6 years, but can we hope to do that in female education even in a quarter of century ? No. What, then, are we to do ? It will not do to let half the population—the better half I should say—remain sunk in ignorance and superstition while the other half marches forward with rapid strides. Husband and wife are bound together for life ; an educated husband and an illiterate wife are like a horse and a buffalo yoked together. As a matter of fact even now, it is women who govern our households, it is women who control all expenditure at home ; it is women who arrange all the different social and religious ceremonies whose name is legion ; it is they who arrange marriages for our boys and girls, it is they who attend on, and care for, the sick in the family and it is they who bring up and look after the children in the most impressionable period of their lives. Those of you who have a fairly intimate knowledge of Indian homes, must have noticed that where the female section of the family is uneducated, superstition reigns supreme and there is absolutely no regard whatever for even the most elementary laws of health, while the hard earnings of the family are squandered on worthless objects.

It will, therefore, be criminal on our part if we do not even now make up our minds to push on the education of our girls and women to the best of our power and ability, so that we may at least have as many literates among women as among men. It is my honest conviction that our province can never make a real advance in civilization until we make up the leeway in female education and men and women march hand in hand on the road to a better order of things. How this can be achieved is of course a very difficult problem and it is unfortunate that no one better fitted for the task has come forward to deal with this subject. I shall submit one or two suggestions for what they are worth. My observations will, however, be confined to Primary Education as that is the subject of my discourse on this occasion.

Hitherto we have been paying very much more attention to urban than to rural areas. This was of course quite natural. Townspeople are cleverer and more intelligent than village people and, therefore, appreciate the advantages of education more than their rural brethren. They also know how to ask for a thing and

how to get it. Village people, on the other hand, are uncouth in manners and extremely conservative and apathetic. Moreover, it is much more convenient to visit schools in towns which are almost invariably on a railway line or on a pacca road than to visit those in villages in the interior of the district, where there is, besides, no suitable place for an inspecting officer to put up in. Town schools, drawing from a much larger population, are also more likely to flourish than village schools—an important consideration for statistical purpose. We, have, therefore, been following the line of least resistance and multiplying schools in urban rather than in rural areas; so that while we are opening middle schools and even high schools for girls in the towns, we are denying most of our villages even the humblest means for acquiring bare literacy. Are we justified in this policy of giving more and more to the Haves at the expense of the Have-nots? A great statesman of England has said that the nation dwells in hamlets. This is particularly true of the Punjab, an agricultural province, where, besides, rural areas contribute by far the largest proportion of provincial revenues. It is, therefore, essential to devise some scheme whereby, without any large additional burden on local or provincial resources, we may be able to bring at least literacy within reach of most of the village girls; otherwise the province as a whole will remain backward in female education and the gulf between rural and urban areas will go on widening year after year. Our difficulties are no doubt almost insuperable. While in the West women are everywhere employed to teach even in boys' schools—and women are the best teachers for children—here we have in many cases to employ men teachers even in girls' schools. Village people who value education only as a means of entering service do not see much use in girls' education unless it is confined to, or at least accompanied with, religious instruction. Boys can go to distant town schools to live there as boarders but girls cannot even go to an adjoining village to attend a school. Neither Government nor local bodies are able to bear any large additional burden on account of education, especially as the advent of the motor car has, it would seem, made pacca roads essential for the existence of the province. Co-education, with all its dangers and all its limitations, therefore, appears to me the only solution of this problem as it at once solves the two main difficulties of want of funds and want of qualified mistresses. I have accordingly been warmly advocating it, though I have at the same time been urging district inspecting officers to try it only where the people have full confidence in the teachers and to confine it to little girls of not more than 9 or 10 years of age.

In this way hundreds of thousands of little girls can acquire literacy without any appreciable increase in expenditure and, thanks to the labours and the wealth of the Punjab Text-Book Committee, a vast store of interesting and useful literature is now being brought into existence and libraries are being provided in all middle and primary schools so that these girls will not easily

relapse into illiteracy again. Another advantage will be the relief it will afford to the Inspectresses who will no longer have to go from village to village to inspect these schools, for even with a district inspectress in every district, it would be impossible to pay regular visits to village girls' schools in the interior of the district. There will be yet another advantage—a great moral gain—for when boys and girls read together in the same school and the girls are more successful than the boys as, I am sure, they often will be, the traditional idea in this country that woman is an inferior being will gradually disappear and the age of chivalry will dawn. This system might, with advantage, be supplemented by a system of grants to religious teachers of the various communities on the lines of the grants paid for adult education and the pace would then be considerably accelerated.

If co-operation succeeds, as I hope it will, then we shall later on need to open a number of middle schools at convenient rural centres in each district under qualified mistresses with special boarding house arrangements for the girls. There will then be plenty of local material available for training women for teacher-ship. It is therefore not necessary to deal with the curriculum and text-books for girls' primary schools. I feel, however, that the present text-books for reading prescribed for girls' schools are not suitable. Most of the subjects dealt with in these books are those suited for boys' schools and where subjects suitable for girls have been introduced they have not been properly dealt with. In Arithmetic I would not teach more than the three simple and compound rules, a little practice and then easy simple interest. In Geography I would confine the teaching to the Punjab, India and the barest outlines of the world.

RELIGIOUS EDUCATION.

BY MRS. NANAK CHAND.

Trusting to your indulgence I have set down a few thoughts on this all-important topic in the hope that they may help to prepare the ground for some constructive scheme.

Religion has been defined by some of our ancient and modern philosophers to be the search after truth. Our Aryan ancestors say, "Satyam Masti Paro Dharma" which in plain English means, there is no religion beyond truth or truth is the highest religion. Still others have defined it as the effort of the individual soul to get into touch with the Supreme Spirit. Whatever definition of religion we may accept there is not the least doubt that religion makes an appeal to our highest instinct. We cannot forget that men in all times and countries have dedicated themselves to the service of God and humanity.

Christ, Budha, Nanak, St. Francis and many other names will occur to the students of History. These men are examples of the fact that those who devote themselves to the Service of God are able to accomplish things which others have not been able to achieve. What is it then that makes men like Budha and Christ Supreme Rulers of the hearts of men? What is it that makes kings and emperors follow in the footsteps of a poor carpenter, a cowherd or a fisherman. What is it we ask that makes a single individual able to influence the lives of thousands of men? It is the religious spirit which manifests itself in these men who lead.

Religion has reference to our emotional side.

Religious education, therefore, must develop and train our emotional faculties and any education which ignores this highest and noblest part of our nature must be regarded as defective. A child if it is not taught to be merciful to those who deserve mercy and to make a sacrifice of his personal comforts in order to relieve the misery around him goes without the highest form of education. You may naturally ask why instead of being a factor of promoting the happiness of mankind religion has been the cause of wars, bloodsheds and riots. I need not refer to the oft-quoted remarks that more crimes have been committed in the name of religion than that of any other institution. The recent communal riots which led to serious disturbances in cities like Amritsar, Delhi, and Calcutta and which resulted in so much loss of life and property are all attributable to wrong notions of religion. Religion rightly interpreted, does not countenance these things. Not only do I attribute these wars and this bloodshed to wrong notions of religion but to the absence of provision for the religious training of the young on the right lines. For youth is the time when the mind is most impressionable and habits are easily formed. Religious education of the right kind imparted at this time will help our young people to grow into well-disciplined, God-fearing men and women. Instead of having fanatics and bigots amidst us we will thus have men who will devote themselves to the service of humanity and will be the pride of their land and country.

The State has so far acted on the principle of religious neutrality and therefore no provision has been made for religious study in schools. Yes, this could be the only right policy to adopt in a land where people professing all conceivable faiths are to be found. But this attitude of the State must change now, the times cry badly for a change and old policy must be given up.

Whatever may be the justification for it in the past we cannot ignore the fact that things have much changed during the last decade or so. With the growth of education, easy means of communication, and the consequent widening of men's outlook, the old narrow views of religion have also been considerably modified. Therefore, it is necessary to take advantage of the changed circumstances and make provision for religious education.

The difficulty of removing conflicts can be easily overcome by calling a conference of broad-minded men of all faiths and creeds. The problem must be submitted to them for their consideration. And I do not hesitate to affirm that men of all religions will come to an agreement in accepting certain well defined and well-established truths which are common to every religion. And if you ask my honest and candid opinion I must say that all religions are one. Says the Bhagwat Gita :—

ये यथा मां प्रपद्यन्ते तांस्तथैव भजाम्यहम्
मम वर्त्मानुवर्तन्ते मनुष्याः पार्थ सर्वथा ।

All paths are mine.

From all sides men try to approach me ; I accept the worship of all in whatsoever manner it is offered.

It will not be difficult to draw up a graduated course of religious instruction based upon these truths. The teaching of these courses must be entrusted to the best paid and best qualified teachers on the staff of the college or school.

No doubt the problem is beset with difficulties but nothing is denied to a resolute will and the results achieved will be a sufficient reward for the labour involved in its solution.

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CURRICULUM OF STUDIES FOR PRIMARY SCHOOLS FOR GIRLS.

BY PROFESSOR RUCHI RAM SAHNI, M.A.

Indeed, I strongly hold that the laying down of a curriculum for girls' schools is *par excellence* a subject which lies entirely within women's own province and that we men may not trespass upon it without taking away valuable elements from the fulness or all-roundness of the free and natural growth of body and mind which is the main object of education. In my judgment, the matter is so obvious that no two opinions need exist about it. The education that may be considered excellent for men may be, at best, of doubtful utility to a woman, if she is to play her part well as the central figure of a family as also in such other wider spheres in the national life of her country, as may be open to her inclinations, opportunities and talents. I wish to lay particular stress upon the education of girls as a preparation for the duties of domestic and social life which await her, because nature has made woman to be the centre, the life and the light of the family and society. It is there that her presence is most felt ; it is in her rôle of the queen of the family and the raidant-point of pure, healthy and elevating influences in society that she shines to her greatest advantage.

Now in framing a rational curriculum we must keep two considerations in view. In the first place, we must be quite clear in our mind as to our aim and object in imparting the instruction for which it is intended to lay down a syllabus. In other words, we must know exactly what our girls are going to do or what we intend them to become after they have gone through the prescribed course of instruction. The second consideration which we must keep in view is equally important. No system of education can *create* capacities in a child which it does not possess already. All that good education can do for it is to provide *ample opportunities* for every one of its faculties to develop to the fullest possible extent. It is this end alone which the various educational methods, including the latest developments of the Montessori Method, are designed to secure. Our curriculum then should be so designed that all the senses of a child receive a fair chance for repeated exercise. The senses have been rightly called the gateways of knowledge, but it is important to remember that it is only by constant use that they acquire the habit, so to say, of remaining open to the outside impressions that might happen to reach them. Besides the senses, there are certain more complex faculties, such as the powers of memory, association, and reasoning which must also be trained and developed by repetition. If there is one lesson which we learn from the recent educational methods it is this: take each faculty which you want to be developed in a child through a series of suitably designed and properly graded drill exercises, in the same way as we do for the development of particular muscles or limbs. Herein lies the whole philosophy of the education of the backward or feeble-minded children.

In India social customs impose certain restrictions upon women from which men are comparatively free. Girls spend a great deal more time at home in the company of their mothers than boys of the same age do. This is an important fact which no teacher can afford to ignore. Apart from other things, we must take serious account of it in framing the curricula of studies for children of the two sexes. We cannot forget that girls do not enjoy anything like the same opportunities as are available to boys for drawing in impressions of the outside world through their sense organs. Their mental horizon and general intellectual outfit is, in consequence, found to be more limited than is the case with boys of the same age. No wonder that, even among themselves, our girls are not half so active or boisterous or quick-witted as boys are. This is a matter of everyday though painful observation.

If girls are not to be left very much behind their brothers, something should be done for them during the earlier years of their life, that is, before they are old enough to attend school and while they are entirely dependent for all their stock-in-trade of knowledge or things upon their home surroundings. In this connection, will you permit me to submit a few suggestions

which my experience as a teacher of more than thirty years standing entitles me to place before you ?

(1) My first suggestion is—provide the girls with suitable toys and plenty of them. A well-known scientific man is of the opinion—I hope the ladies will pardon the unchivalrous character of his remarks—that, taken in the mass, women are not so intelligent as men of the same class are. He attributes the superior intelligence of boys to the fact that they play with spinning toys, while the girls, as a rule, do not. I believe myself that there is a good deal of truth in these observations. From the earth, the moon and the other heavenly bodies to the tiniest material particles which the latest scientific investigations have revealed to us, viz., the electrons, are they not all so many spinning tops, large and small, the movements of which we men, can understand more readily than women, because, forsooth we have been playing with spinning tops, while women, as a rule, have despised them. I am glad in Western countries, things have changed very much for the better during the last half a century, but, I fear, Professor Perry's remarks are substantially applicable to India to-day, as they were perhaps applicable to England in the eighteen-eighties when they were first uttered. Amplifying this idea, the need for the provision of more and better toys for girls than they can obtain at present becomes obvious. This conference may do worse than set to work at once and form a Committee for the improvement of the cheaper kind of toys which are sold in the bazar. Most children are too poor to have toys of any kind at all, but even those that can afford to purchase them often do so to the hurt of their artistic tastes and sensibilities. The clay toys which are exhibited on the roadside at various fairs (*Melas*) are so ugly and misshaped that they cannot be a source of much instruction to those who possess them. Do not, I pray, let the authorities of the School of Art have any rest so long as a single hideous toy is turned out and publicly exhibited for sale in any part of this province. If necessary, let wooden moulds be supplied free of charge to the makers of clay toys at the expense of the Education Department. It is also time to break the cruel monotony of child life by placing new toys before our boys and girls, specially cheap mechanical toys. Japan did a good deal in this direction during the war and now Germany is working wonders by sending us tons of cheap toys. Some of them I warn you are dangerous in the hands of little children, being highly combustible. I am sure there is talent enough in this country, but it is waiting for proper stimulus and encouragement which can best come from this Conference.

(2) Connected with the subject of toys is that of games. Too much importance cannot be attached to the playing of games, specially in the case of girls, as an essential part of our educational system. Apart from the importance of playing games as a means of healthy physical exercise, I wish to draw your particular

attention to two other aspects of it. In the first place, games provide us with the means of acquiring useful knowledge of the general properties of common objects, that is, their shapes and forms, colour, taste and smell; and whether they are hot or cold, rigid or elastic, soft or hard, etc., etc. More important still is the smooth and graceful co-ordination of muscles which can be acquired in no other way half so well as by playing suitable games. I think I am voicing the opinion of all present here when I say that few qualities in women are valued and admired so much as gracefulness. I imagine that in the graceful evolutions of limb and form which accompany dancing lies the charm which makes such a powerful appeal to the fancy of men. Dancing is tabooed in respectable circles of Indian society, but there are two or three indigenous games which girls may play and which are, I believe, as conducive to the development of graceful movements on the part of the girls as dancing. It is for the more enlightened members of this Conference to rescue such games from the neglect to which our present day education seems to have relegated them and press them into service again to a higher and better purpose than they have ever served before.

(3) The folklore of the province should be collected, arranged and systematized in little books. The real test of knowledge lies in the amount of pleasure which it gives to the recipients of it. I have seen children of three, four and five years keeping up late hours, in spite of the protests of their parents, listening to little stories of not more than half a dozen short sentences. They ask for these stories to be repeated again and again and they listen to them even when they are repeated for the fourth or fifth time with unabated zest. Here is a lesson of deep significance for the framers of curricula for our Primary Schools. No lesson that does not awaken the interest of a child or excite in him or her, a feeling of positive pleasure is of much educational value. I know I am using the word curriculum here in a wider sense than is usually attached to it. But there seems to be no reason why such instruction as the toys, games and folklore provide should not form part of a well-considered curriculum for our children.

Similar remarks would also apply to little rhymes which may often mean nothing but which still serve a most useful purpose provided they are judiciously selected and used.

(4) Higher up the educational ladder at the stage when the use of the printed page becomes a necessity, I would suggest the use, as part of the reading matter for elementary girls' schools, of stories or easy poetical selections from classical literature. No book, for instance, has influenced the religious and social life and thought of the Hindus a thousandth part of what the Ramayana has done, and I cannot conceive of any course of instruction, at least for Hindu girls, from which this gem is excluded. Here are four lines which I once heard my *chaukidar* singing as part

of a long piece in the middle of the night as he was keeping his accustomed vigil.

برکھا بن ساگر کون بھرے مانا بن آور کون کرے
بھرا نا بن دھیرج کون دھرے رام بنا تو کھ کون چھرے

I make a present of these lines to the framers of curricula for our elementary schools. For euphony, for simple, chaste, melodious diction, as well as for the deep wisdom and sound moral instruction which they embody, these four lines are a good specimen of what lessons from the Ramayana and other Indian classics may be expected to be.

I must stop. During the twenty minutes allotted to me, I have ventured to throw out a few hints and suggestions towards the framing of what I conceive to be a sound rational curriculum for our elementary classes for girls. Recapitulating in the few words these suggestions may be put thus:—

The curriculum should be so designed as to

- (1) develop and train all the faculties and powers of the scholars to the maximal limits,
- (2) fit them best for the duties and responsibilities of domestic and civic life, and
- (3) make the acquisition of knowledge a thing of pleasure and not a task.

In conclusion I will add that this is only possible when instruction is imparted to the girls through their own vernacular. For the majority of girls, both Hindi and Urdu are little better than foreign tongues and cannot take the place of the mother tongue which alone they use at home and understand without effort. Mr. W. Bell, one of the ablest officers who have guided the educational destinies of this province, used to say—When Punjabis want to show that they are educated persons, they talk to one another in English when they address persons inferior to themselves, such as servants, they speak Urdu, but when they talk among themselves, then they use nothing but the homely Punjabi. It is this homely Punjabi which must be the medium of instruction in the Cis-Sutlej districts of this province.

AN INTRODUCTION TO A DISCUSSION ON THE MAIN AIM OF THE EDUCATION OF GIRLS IN THE PUNJAB.

By Miss E. M. EDWARDS, M. A.,

Principal of Kinnaird College for Women, Lahore.

Writers of books tell us that the aim of education should be the good life, a sound mind in a sound body, (to use the vocabulary of a bygone day) or the perfectly integrated personality, (to use the language of to-day). Heads of Education Departments speak as though the aim of education were the reduction of illiteracy. The real, if not the admitted, aim of education for many teachers is to get the girls through their examinations. And last, but not least, parents and publicists tell us that the aim of the education of girls should be to produce good wives and good mothers.

Probably we shall all need to confess that we seldom, if ever give thought to the main aim of education. We receive some lectures on the subject during our course of training for teaching and perhaps we answer a question on the subject in our J. A. V. or S. A. V. Examination, but after that we become so much concerned with methods of education that we forget the need of an aim. Those who are junior teachers excuse themselves on the grounds that they are just small cogs in a big machine and that all that is expected of them is that they will carry out orders, in fact they often say that it is waste of time for them to give thought to the main aim of education, when they are not even invited to join in framing the policy of their own schools; and they even say that when they, in their first enthusiasm for teaching, made suggestions to their superiors, they were only snubbed for their pains. Those who are seniors excuse themselves because they are too busy with the routine of administration to think of anything so remote as the main aim of education or they blame their subordinates, saying that these do not wish to hear of anything which will involve departure from the comfortable old rut. This is a sad picture, perhaps it is overdrawn but I feel we must all confess it is not entirely untrue.

It is good that this conference has challenged us to give thought for a few minutes to the main aim of our work. Unless we take time occasionally to view our work as a whole and to consider whither we are bound, we shall lose the art of thinking, the art of seeing things whole.

In seeking to clear our minds on the subject of our aim in education let us ever remember that the school is only one of the influences in the life of the girls. It is true that some boarding schools absorb all or nearly all of their pupils' interest and consider they have done their work well when they educate the

children to be as unlike their parents as possible, but parents are beginning to resent this. In framing our aim then we must remember the homes from which the girls have come, how long they are likely to be with us in school and the homes to which they will go after school days are over. We dare not accept another's aim as our aim ; each nation, each school needs to think out an aim for itself.

At first I protested against this subject being assigned to me. My experience of teaching in India has been so short and I have served in one institution only. Since my experience is so limited I wish to make my paper quite short, so that teachers in different types of schools may be able to tell us their aims for their schools.

What is our aim in College Education, in High School Education, in our Middle Schools ? What is the aim, and what should be the aim, of those who are educating the hundreds of little girls who stay in school for one year only ? I have often wondered if it would not be wiser to abandon the effort to teach the elements of reading and writing to those who will not stay in school long enough to become really literate : could we not use this one precious year to better advantage if we thought out our aim for pupils of this type ? I shall be much interested to hear the discussion of this subject.

Although each stage of education and each school may have its own special aim, I think we will all agree that the main aim of education is essentially spiritual. How are we to prepare our students to go out to meet a world full of dirt and disease, of cruelty, ill-temper, small mindedness, injustice ? We shall not be equal to our task unless we ourselves are fortified by a belief in friendliness, in beauty and truth and goodness and a belief in people, that they are capable of responding to these ideals. It will be of no avail to talk to the students of beauty, truth, goodness and friendliness unless they see that these things are a power in our own lives. We have been reminded in this conference that we must begin all reforms with the teacher, not with the textbook, so I would say that our main aim in education is for us as teachers to keep our souls alive. We know full well that the schools exist for the scholars, not for the teachers, nevertheless I am sure it is right for us to cherish this apparently selfish aim, otherwise our teaching will degenerate into mere lifeless routine ; work and shrewd parents will question whether it is worth while to send their children to be taught by us even for one short year.

THE TRAINING OF TEACHERS.

BY MRS. SIRCAR.

(Lady MacLagan High and Normal School, Lahore).

The previous paper read before us has already shown what vast progress has been made in the training of vernacular teachers. I now propose to give you a few stray thoughts as regards the future of the training of these teachers. At present there are 5 schools giving junior vernacular training and one school at Lahore which prepares the girls for the Senior Vernacular Teachers' Certificate. Before I go further, I would emphasise that the policy of the Department is towards a literate Punjab. I understand that the Men's Department is working towards providing facilities within the next 10 years or so, for every boy of school-going age to get a chance at least of having a primary education. But suppose this hope materializes into an actual fact, will it ever be possible to call the Punjab a literate Province, when about half of its population belonging to the weaker sex still gropes in the darkness of illiteracy? It therefore comes to this that to make the Punjab a literate Province, many more girls' schools will have to be opened to keep pace with boys' schools. How then will it effect the training of teachers?

As I have said before, there is only one S.V. Government Training school. This school sends out on an average about 50 teachers a year; of whom about 15 do not take up work away from large centres, having only 35 to feed the Punjab schools. Past experience has shown that many of these girls do not like to go out of Lahore. A Circle Inspectress recently told the writer that many of the schools out in the districts are clamouring for teachers, while a number of last year's pupils of the Lahore Normal School are waiting for work at Lahore. One of the reasons is that there are very few schools which provide places for their teachers to stay in and unmarried girls cannot go and live by themselves alone, and so the girls from Lahore do not care to go out. Here I must remark that almost all Government schools do provide accommodation for their teachers, but private and aided schools do not. This being the case, if new schools are to be opened in various places to give every girl of the school-going age a chance of having primary education, where will the teachers come from? To my mind, the true chief requirements are proper quarters for the teachers and S. V. Training at more centres than one. You must have noticed that I did not consider the case of J. V. Trained teachers and the 5 schools giving this training. The qualification required for joining the J. V. Training class is a certificate of having passed the V Primary Examination. The training course is of two years, after which these girls are sent out as teachers. If education means "complete living," how can we expect these teachers to fulfil the task demanded of them, if they themselves have had such a meagre education? Moreover the

experience in the Normal School shows that most of the first year of the two required for the training are taken up with teaching ordinary school subjects (other than methods, Psychology of the child mind, methods of mental training, etc.), as Miss Mozamdar has already said, if J. V. teachers are to be fitted properly for the task of training of young minds, they should be at least 3 years at the Normal School, the 3rd year being taken up for purely Normal subjects. Besides, I would suggest that there should be an intelligence test for candidates applying for a scholarship for the J. V. Training. Such a test would eliminate students who may have passed the V Primary, but are unfit as trainers of young minds.

Syllabuses for the J. V. and S. V. Examinations.

There being a vast difference between the training of boys and that of girls, the syllabuses naturally have to be different; such subjects are included as domestic economy, washing, cooking, sewing, etc. There is a special officer in charge of these subjects. But the syllabus contains no Physical training or games (as in the case of J. A. V. Examination) suitable for girls' schools. The objection is often made that most of the girls' schools have no place for games or physical exercise. This should be no reason why the trained teacher should not be ready to take up this work, should such an opportunity occur in any school. In the Men's Department a good deal of attention has recently been paid to the health of the school boys and some of the teachers who have already taken their S. A. V. and B. T. have been sent again to the Central Training College for a further course in Physical Training. The health of the school girls is just as important if not more owing to their rather close lives at home. The course of Physical Training might also include such a movement as that of the girl guides. I may point out in this connection that our D. D. P. I. has always emphasised the need of this movement in our schools and Rawalpindi has already taken it up.

Another thing that might be added is the care and use of libraries. For larger schools they should be taught how to feed the class libraries from a central one and thus inculcate the habit of reading among the scholars. Education proper should not cease when a pupil leaves school. A spirit of further and constant reading should be infused among the girls and this will only be if the teachers are enthusiastic about this phase of their work. Of course a lack of good vernacular literature is a great drawback, but so far as it is available it should be utilized properly by the teachers.

A most important thing in the Normal course for junior class of teachers is the *General Information* Classes. Most of these teachers at present think that their duties cease when they have finished with the ordinary school subjects, their own general information being very small.

Let us now consider the higher training for teachers. There is only one private aided school in the whole of the Punjab which gives Junior Anglo-Vernacular Training—The Kinnaird High School for girls—and the services it has rendered for 22 years towards training of teachers cannot be praised enough. The increase in the number of Anglo-Vernacular Girls' schools and high schools shows that there is a steady increasing demand for higher education for girls. This being so, there will be sooner or later a demand for other Training Institutions giving J. A. V. Training. The higher pay demanded by these J. A. V. trained teachers as compared with men, shows that there is a dearth of Anglo-Vernacular teachers among women.

Next comes the S. A. V. and the B. T. Up to the present all S. A. V. and B. T. teachers have had their training at the Central Training College with men. This blocks the way entirely for purdah ladies. Moreover such pupils have to practise in one of the girls' schools, where the professors are unable to guide them and they are thrown on their own resources. But we owe our thanks to the Central Training College for taking in girls and doing all in their power to make it easy for them to take this training. If ever we hope to have better qualified teachers of all community the hope can only be fulfilled by having a Women's Training College.

Another fact that I wish to present in this connection is that there are hardly a dozen B. T. women teachers in the Punjab.

But the Department is very sympathetic, and we have to thank our D. D. of P. I., for already a move has been made in this matter. Government has sanctioned the grant of 5 scholarships for S. A. V. candidates, for a class to be shortly opened at the Lady MacLagan High and Normal School for Women, and it will not be too much to hope that in some near future the B. T. class might also be opened as predicted in one of Miss Stratford's old reports.

Lastly I touch upon a subject on which a good deal will be said at this Conference, and that is *Adult Education*. Whether the Province is literate or illiterate in the course of the next 10 or 15 years, depends a good deal *not* only on the work of the schools, but on the individual teacher. The trained teacher should be an influence within her circle, to foster a desire for knowledge. If I say that a teacher should be more or less a social worker in the present state of the province, I would not be far wrong. This mostly applies to village teachers. If some of the library books and papers are to be used to spread knowledge and a love of information, a good deal could be done towards the problem of adult education. Perhaps she could even read to illiterate women round about her school sometimes in her spare time. This love of spreading literacy in the Punjab can only be inculcated at the training schools or colleges.

Finally, I wish to point out that some of the things mentioned here are not a criticism of the present system, but mere suggestions, which with modification according to the need may prove useful at some future time. As I am closely connected with the training of women teachers I can say from my practical experience that in spite of the fact that further progress can be made on the lines suggested above, a great advance has already been made in this direction. The extent of this progress can be fairly judged from the paper read by Miss Mozamdar and I need not go over the same ground to waste your time; suffice it to say that under the able and kind guidance of our D. D. P. I. who has taken a personal interest in teachers and their training tremendous studies have been made.

I may be excused for quoting the old old saying that "the hand that rocks the cradle rules the world" and the training of the future mothers of the province depends a good deal on the kind of teachers we train and send out.

MUSIC AND ART IN GIRLS' SCHOOLS IN INDIA.

BY MISS J. MARTIN, B. A.

(*Pathankot.*)

The music of India is not appreciated by the Western ear any more than the music of the West is really appreciated in the East, and I believe that it is true to say that it is less appreciated, because there has been less study of Eastern music by the Westerner. It is a mistake to think that Eastern music is crude and harsh, violating the rules of harmony, just because the Eastern rules do not agree with those of the West.

Indian music consists almost entirely of melody, instrumental accompaniment being performed in unison, and any attempt at harmony being confined to a continuation of the keynote. The theory, also of the music is different. The Indian octave consists, like our own, of seven chief tones; but, while with us it is subdivided into twelve semi-tones, the Hindu theory distinguishes twenty-two intervals, varying in duration between quarter, third and semi-tones. There are three varieties of scales differing from each other in the nature of the chief intervals. This seems to us very complicated and makes the study of Indian music very difficult. I have never made such a study, and so do not expect to give a paper on the technical points of it, but will try only to show how India's own ordinary music can be so adapted as to be of practical use in school work.

I have mentioned some difficulties in the theory and structure of Hindu music. Another difficulty is that it is of the minstrel type. In olden days, wandering minstrels recounted heroic deeds

in song to appreciative audiences, who gave physical response to the rhythm of the tune, while the singers, creating a sympathetic atmosphere, compelled mental and spiritual acquiescence to the sentiment of the song. I once attended a gathering, where singers from many villages sang by turn. One singer would sing in recitative style, joined at intervals by a chorus of other voices, which by repetition and accent emphasized the theme. The large tent was full of people, but so quiet that no sound was heard except the voice of the singer, but the physical vibration in response to the rhythm of the song was distinctly felt. At the close of the song the moment or two of absolute silence, while the audience seemed to be recovering from a trance, was more eloquent than the applause after the silence, which seemed to me to be borrowed from the West and not to fit in.

The recitative style used by good singers allows for great variety of time and expression, but it would be extremely difficult to get the same effect in concert singing. Even to approach it, it would be necessary to create a rhythmic atmosphere, with such marked gradations of sentiment as to emphasize the required modulations of time and tone. The primal necessity in Indian music of having the whole body respond to the sentiment suggests interesting possibilities in its use in the school room.

I had been in India a number of years before I could appreciate real Indian band music, or think that it was anything but a jumble of sounds. This was probably because I had only heard bands which tried to adapt Western tunes, such as, "My father and mother were Irish," and "Home Sweet Home," to Eastern musical time and metre, also without first tuning their instruments. One night I attended an Indian wedding, and from the roof of the house, where the women were gathered, looked down on the crowd of men guests, who were listening to a good Indian band playing real Indian music. It seemed to me that I could feel the vibrating response of the audience even at that distance, and after a while I caught the accent, syncopation, and regularity of concussion which caused the sympathetic and rhythmic response from the listeners. And harmony was there, with measures made up of full and fractional counts, and variations in time and melody, but which always centred around and returned to the main theme. Such music would be too complicated to use in school work, and would have to be so simplified for practical use, as to rob it of what is considered to be necessary to real good Indian music, but surely it would be worth while to make an effort to secure the same rhythmic response on the part of the children.

Rhythm is a basic principle of Indian music, and it seems to be born in the Indian child. This is a great inheritance, and it gives a good basis for teaching music and games to school children. In the practical West, rhythmical songs and games are

taught in schools to develop the sense of rhythm. One has only to watch a group of Indian village children to realize that rhythm is the basic of most of their games--at least games for girls. A double purpose would be served if more use could be made of these games in our schools, for not only physical exercise is obtained, but the sense of rhythm is developed with more exactness. English games are sometimes taught to children, and they have a certain value. "Go in and out the window" or its translation, might almost be styled a motion song rather than a game. In such games as "Drop the handkerchief" there is little physical exercise, and the tendency is, if the choice is left to the children, that a few popular children repeatedly get the handkerchief, while the unpopular ones stand through the game with no chance of taking part. In such games the teacher, with a little tactful direction, can teach unselfishness in the choices made. I consider some Indian games superior to these and similar games, and they have more appeal to the Indian child. Such games as "Asàn berian nūn jānā. Sādā rūi pinjdā," not only give pleasure, but develop physically, as well as emphasize rhythm, and they, too, have an educative value. There is one thing to be avoided in this and similar games. If two girls are experts at the game, the other children are inclined to allow them to do all the action part of it, while they themselves stand in a circle, clap their hands, and sing. Both parts are valuable, but the children should be taught to do the action part by turn. This is true, too, of another game, "Kade te pind āegā, bhajāi chal ghorā." This tendency to allow one or two only to perform comes down from the old minstrel idea. These games can be made of great practical value, if, as I have said, the action part is done by turn. Children are often shy about taking part in these games, when others can perform the action part more gracefully, but such children really need practice more than the more expert ones to develop suppleness and grace of movement, as well as physical fitness. There are games, however, in which all take an equal part, such as "Chhe chhamundri ho, Terā kaun bichārā ho," and "Sāde vere ā variyā badāmī mor." These games are splendid both for physical culture, and the development of the rhythmic sense.

We turn now to consider voice culture by the use of songs in the school programme. In this it seems to me that a modification of the Indian ideal of good singing would cultivate voices more pleasing to listen to. It may be that my ear has not yet been trained to appreciate what is considered good singing in the East, but I would like to illustrate what I mean. I was passing through the streets of a town one day, and heard an Indian music teacher give a voice lesson to a pupil. I stopped and listened for a while in order to analyse the difference in method and quality of tone used, as compared to our music. The chest tones were used even in the high notes, and the runs and trills and quavers showed great skill and voice development. The teacher was most exact

as to the tone required, and the result was not unpleasant, but such tones could only be used by trained voices in solo singing. When chest tones are used by a concert of untrained voices, the result is a harsh sound which grates on the ear. I remember once in a Convention, three men sang a Panjabi song pitched in a high key each shouting at the top of his voice, using only chest tones, and the sound was so painful that I had to put my fingers in my ears. From remarks made later, I found that Indians, who knew good music, considered the singing as crude and ludicrous as I did. An uncultivated voice will draw the chest tones up at the back of the throat, and this makes a harsh sound without resonance. I believe that an effective modification can be made in the singing voices used by our school children which will bring more pleasant results. May I illustrate? We held a Teachers' Conference recently in Pathankot, and the Avalon High School girls gave an evening programme of Indian songs to the accompaniment of Indian musical instruments. Afterwards, many said to me, "How do you get rid of the harshness shown in the voices of most school children?" I told them that we had made no special effort, but that in singing English songs they learned to use head tones, and that when they had once learned to use them, they did not go back to the use of the chest tones even in singing Indian tunes. It is not necessary to teach children English songs in order to teach them the use of head tones. I find that even the little children know what I mean when I say, "Mithi àwàz se gànà. In the middle of the programme to which I referred, a girl who had recently come from a Vernacular school sang a solo. She used only chest tones, and her singing may have been more nearly ideal Indian singing, but I believe that the more melodious voices of the chorus had a more pleasing effect upon all who listened. With the accompaniment of Indian instruments the chorus singing seemed to bring out the melody of the Indian tunes. Some one may say, "Ah! but that is not real Indian music." If more practical and more pleasing to the ear for concert singing, why could it not be made to be considered real Indian music? As a matter of fact, singing in concert is not Indian, but that is what we want in school music rather than solo singing, and why not work for more pleasing results? Also, why not make use of a larger number of the many good Indian tunes, by adapting them for use in the school room?

Another characteristic of Indian music has a great appeal, and could be made use of in selecting tunes to be used, and writing songs appropriate to them. There are tunes to be sung only in the morning, and morning songs might be written for them; other tunes are sung at noon-tide, and others in the evening. School songs composed, suitable to be sung to these tunes at the proper time of day, would be very popular.

Indian music for schools is as yet a field almost untouched, except that a good many motion songs have either been translated

from the English, or better, written in the vernacular with Indian setting. These are valuable in developing the imagination, and so have a great educative value. A great work in the preparation of school songs waits for those who have talent, and not only understand Indian music, but the necessity of a practical modification of it to meet a need in the modern Indian school.

I would like here to make a digression and mention another need closely related to concert singing in the school room, and that is the need to teach the art of concert reading. When in China, I visited a girls' school, where the morning lesson was read in concert and beautifully done. They told me that in the Chinese language the use of a syllable in a high or low tone often changes the meaning, so exact tone is very necessary. As a result of this, great care is taken to pronounce the syllables exactly together, and the different tones and modulations in exact concert make a very pleasing effect. In India (perhaps this, too, is the result of the wandering minstrel idea) when concert reading is attempted, each one seems desirous of going his own way, with disastrous results. Singing and reciting poetry in concert should help in teaching effective concert reading, and the psychological effect of this is educative in teaching better team work. The Indian has another enviable gift which has never been developed in the school room, and that is the gift of improvising in song and rhyme. I have heard villagers improvising recitative tunes in singing words that had little meaning, as they travelled a dark road at night, singing to keep up courage in real or imaginary danger. You can give some children tunes, and you will find that they are able to improvise a little rhythmic song as they sing the tune, or, in some cases, they can improvise a tune to a rhyme. This gift could be developed along with the impromptu drama now so popular in the school room.

India does not need to borrow her music from the West. There is a vast store of music in tunes that should be conserved for the needs of the future by those who have talent, and also a vision of the possibilities of their use, not the least use being in aiding to educate the children in the school rooms of India.

Let us now take up the discussion of Art in the school-room.

The Art of India is of the past, and unlike music it has, for the most part, been left to the past. During the time of the Moghul kings, under their patronage, the art of painting developed greatly. Some portraits and miniature illustrations of that time show excellent work, even wall painting can still be seen in some old buildings. Religious zeal, romantic adventure, and impassioned song inspired expression in colour and architecture, which developed to a high degree of perfection under these kings.

Art had not been held in high esteem by the ancient Hindus and the encouragement of these kings had put it on a new basis

with possibility of such development as is found in other countries ; but the decline of popular taste brought about a decay of artistic achievement, and at no time since has there been anything to compare with what was accomplished during the time of the Mughal kings.

Countless old illustrations of Hindu mythology can be seen in museums. In them 'human form is conventionalized, but they are full of characteristic poses of man and beast.' Two things which are considered necessary to good art are lacking, perspective and depth. All the figures stand out more or less in a straight line in the foreground. You will find the elephant and the peacock much the same in size, the tiger is the most prominent thing in the jungle in which it is supposed to hide, while a temple is little smaller than the perfectly rounded hill upon which it stands. All the details of the picture are crowded into the foreground, with perhaps the doubtful advantage of leaving much to the imagination !

For the most part art has been relegated to the past as merely related to the traditional happenings and times of the gods. It is not that artistic sense is lacking, but it has not been related to every day life. Nature's beauties do not have the appeal to the Indians in general that they have to the Japanese, who seem to live near to Nature's heart. Japan is like a picture, with picturesque houses and gardens fitting in with a landscape unusually beautiful, and the Japanese are able to picture beauty in a way that appeals. They see beauty and are able to make others see it. In contrast to the beautifully neat, though simple, homes in Japan, the Indian house, speaking in general, seems only a place to exist. Few towns in India can boast of striking features of artistic and architectural interest. Ambitious builders succeed in piling up structure too ornate to satisfy the requirements of Art. This goes to show the need of the education of the artistic sense in the children of our schools. It is not that there is not beauty in Nature as seen in India to inspire. Nowhere in the East is her colouring more vivid, and frequently, in contrast, the softest and most delicate tints are caused by atmospheric conditions. With such variety of beauty, there are unlimited possibilities in the training of future artists.

But a beginning must be made in creating a love for the beautiful. I spent a summer in one of the sacred cities of India where the thought of the people is constantly turned toward religious devotion. During the rains, the sunset clouds showed wonderful colouring in beautiful shades. We were busy during the day, and walked out at eventide to enjoy Nature's wonderful picture book. I watched the people going to their homes from their work to see if there was any response in their faces to the beauty about them, and during the summer, I saw only one raise his eyes to look at the beauty of the sunset as he

plodded along. In one school where I was a number of years ago, I used to try to get some response to the beauty of the sky at sunset from the girls, but it seemed to have little appeal—there were no Japanese among them !

But there has been a change during the past few years, due partly to a larger outlook on life, and partly, may we say, to the teaching of drawing and colour work in schools. In Pathankot we have wonderful views of the snowy ranges, and their beauty in the sunset glow beggars description. The school girls often express their appreciation of the beauty. One girl in a letter said that the mountains seemed to be covered with silver sheets, while the glaciers were silver streaks running farther down the mountain sides, and (as another said) at sunset the silver turned to gold. She added, "When a girl gets homesick, the best remedy which the others can suggest to her is to go and look at the mountains."

Let a child draw a flower, and get the right shades in colouring and all flowers will then be more beautiful to her eyes. For a number of years I have been interested in a picture competition, where prizes were offered to the pupils of the Panjab Sunday Schools for the best picture illustrations of chosen lessons. The prizes were offered in order to find some talent in India to illustrate Bible stories with Eastern setting for Indian children. The response has not been very encouraging, although within the past two or three years better pictures have been shown, which proves that there has been improvement along this line.

The practical purpose of teaching art in schools, and later in Schools of Art or Design, is not only to increase the appreciation of art, but to realize the market value of better design in workmanship, and a marked improvement in the articles made is seen, which brings craftsmen into touch with wider markets. At the British Empire Exhibition the different Provinces displayed a diversity of exhibits characteristic of the different parts of India. Typical handicraft products were shown, while the exhibits from the Arts schools introduced to Western notice the work of modern Indian artists. The displays attracted many visitors, and the majority of the exhibitors expressed themselves as well satisfied with the result, especially in the receipt of orders which they received. The introduction of many of India's characteristic products to Western buyers will, it is hoped, serve to open to her new markets, increasing in number as the value of her products increases.

The Technical Institute of Srinagar has done much to develop and standardize the wonderfully artistic handiwork of the Kashmiri. The ability of Indian women, who have been taught to make hand embroidery, is not excelled in any country unless it be China. The chief lack is in their ability to execute original designs, which are true to nature if flower designs, or attractive

if conventional ones. The teaching of drawing and colour work in the schools will very quickly develop this ability with such apt pupils.

The Indian loves colour, and has the gift of imitation to a marked degree. He also has imagination, which is so necessary in developing original as well as characteristic designs. Initiative to carry out original invention and design can only come with practice.

Such displays of handiwork as are seen in this Educational Exhibition emphasize future possibilities, which will fully repay all effort that has been made to improve Art in the schools of the Panjab.



ADULT EDUCATION IN THE PUNJAB.

BY MAULVI MOHAMMAD IQBAL SAFI,

Headmaster, Dijkote, District Lyallpur.

Adult Education is a recent movement in India, and has not been conducted on a very large scale as yet. Ours is a country in which the vast majority of the people are handicapped in their private lives through ignorance. They cannot read or write, and are consequently shut off from sources of information which could everywhere be made available through the agency of the printing press. They are entirely dependent for information regarding events and affairs on any one who poses to be a preacher. It is, moreover, unfortunate that those who consider it their patriotic duty to inform the illiterate masses confine themselves to political affairs, and even in this direction their views are crude and unbalanced.

The majority of the population of our country reside in villages, in which the ordinary daily life requires a good deal of improvement.

The country is progressing towards self-government in which the greater part of the administration is entrusted to the representatives of the people, who in order to select their best men must be well-informed. It is, therefore, incumbent upon the people that they should understand and realise the rights and obligations of citizenship.

Different terrible epidemics spread every year in the country and cause great havoc. Besides, there is a large amount of infantile mortality. These losses are due to the ignorance of the principles of sanitation and child welfare on the part of the people.

The prevalence of superstitious beliefs, strange rites and customs indicate the ignorance of the grossest kind in which thousands of our countrymen are steeped. These could be effectively removed by instructing the masses.

The general spread of literacy among the adults would also lead to the universal education of the children.

In order to fight this prevailing illiteracy and ignorance, we have to educate the adults who have not been favoured with opportunities for using the schools and thus benefiting by the advantages of education in their younger days.

Some considerations regarding the selection of matter are **What to** advisable. Unless the subject matter arises out of **teach.** the present life-conditions, and is so presented that it becomes an actual part of the people's experience in his daily life, it is of little lasting value to him. Our aim is that the pupils should not only fit successfully into the life round about them, but we desire that they should improve the physical, social and moral condition of the village. This will mean that the teacher should determine what are the present shortcomings in the performance of daily duties in the method of living in the community, and should endeavour to discover how these may be dealt with, and the conditions improved. This would involve a study of the present prevalence of disease, its cause and prevention, how better health might be maintained, how present methods in agriculture and industry can be bettered, how the community can work in closer co-operation and harmony, and how social and moral conditions can be improved.

Adults require a special curriculum. It should be practical and more self-sufficient than the ordinary curriculum **Nature of** for the Primary Schools. If the books are of **Work.** the right type, they would greatly help the teacher in keeping his pupils together, and securing their active co-operation. The curriculum should include, since our aim is literacy, the three essential subjects—Reading, Writing and Arithmetic. Ability to read simple prose, to transcribe, and to write from dictation, a knowledge of the simple rules of arithmetic, together with oral practice in compound rules such as the pupils are likely to find useful in every day life, should be the aims in any course of study for adults.

The only books available are those prepared for children in **Nature of** schools, but these are obviously both on account of **Books.** their subject matter and their elementary style unsuited to the requirements of the grown-up scholars who, though illiterate, have a more advanced intelligence and greater experience than the children.

The books written for this purpose should contain talks on a variety of interesting and useful subjects such as agriculture, hygiene, co-operation, elections and franchise.

To meet the requirements of adult education, the following Selection of topics may be suggested :—
Material.

- (a) Public health and personal hygiene ; cleanliness of person, home and village ; ventilation ; wells and water supply ; common diseases, how to avoid and how to remedy them.
- (b) Care of children, cleanliness, food, clothing, common ailments, infantile mortality, its causes and prevention.
- (c) Education and General Knowledge ; selected topics dealing with people and activities in other lands ; outstanding periods and events in the history of India ; the practical lesson of history ; the rights and obligations of citizens ; Government ; education, its advantages, scope and cost ; education for leisure, hobbies, education in India as compared with other countries ; the Education Department and its work.
- (d) Agriculture. Improved methods and implements, wheat, cotton, sugarcane, selection of seeds, care of cattle in health and in sickness, improvement in breeds, veterinary hospitals, demonstration farms, the agriculture college, the agricultural department and its work.

Other departments could furnish syllabuses equally interesting and comprehensive, *e. g.*, Irrigation, Forest, Industry, Co-operative Credit Societies, Railways, etc., and lectures could also be prepared on roads, communications, trade, local resources, arboriculture, and current events.

There are two principal ways in which the adults can be Means. educated :—

1. By means of schools, specially started for this purpose, of which the chief aim should be the removal of illiteracy.

2. By means of easy informal talks or lectures which should serve to impart useful information on various subjects and seek generally to widen the mental horizon of those to whom they are addressed,

Both methods have their own uses, and should, wherever possible, be employed to supplement each other.

Schools. Appreciable attempts have been made in the Punjab to open night schools for adults. These schools have been attached to the Government, Municipal, Private, and Denominational schools, and teachers in all these institutions have been called upon to take turns in conducting these classes. Every Normal School too has an adult class attached to it, in which selected pupil teachers are called upon to work.

The housing difficulty has been solved by holding the adult classes in the evening in the ordinary school buildings. In villages, where no day schools exist, the Co-operative Department has been requested to open and maintain adult schools with the help of special grants awarded for this purpose.

School terms and Sessions. The aim should be to give recruits a clear six months' work in order that, at the end of that period, they should be either literate or on the highroad to it. There should be two terms, one for the winter, and the other for the summer. The winter term might suitably begin in the month of October or November as the autumn crops would, by then, have been reaped. As this season gives the best opportunity for concentrated work, the pupils should be expected to attend school during this term for two hours daily on six days in the week. During the summer term excluding vacation the school might be open on, say, two days in the week, when the pupils who have attained literacy or nearly so, should read and work under the general guidance of the teacher. The actual time of instruction should be fixed with reference to the convenience of the pupils. These terms and sessions would probably be found suitable to both urban and rural conditions.

Method of Teaching :—It is clear that adult pupils will progress at a different rate than do school children. When once the rudimentary ground work has been covered, the teaching should be largely individual. In the case of adults, the primer should be dispensed with altogether. It has two obvious disadvantages. First, the teacher is likely to think that even if he spends three or four months over it, his work would be considered commendable in view of the fact that an average boy requires more than a year to work through the same stage. This is an entirely erroneous opinion. An average adult should not, and in practice does not, provided the instruction is imparted on sound lines, take more than six months to become literate. The second disadvantage is that the scholar on finding that he cannot master

the primer in two months, concludes that the task is an impossible one, and gives it up in disgust and despair. Therefore the elementary work of recognising letters and their simple combinations should be done on the blackboard and as soon as the scholar can read simple words like *dár*, *gaz*, *jána*, *khána* they should begin the first Adult Reader.

Rafiq-i-Zemindar by K. B. Sheikh Nur Elahi, Inspector of Schools, Lahore Division, is a very useful book, especially prepared for the adult pupils. It has been divided into three graded parts, and deals with the topics of practical life in the villages.

To persuade people to junior night schools, the inspecting officers might seek the help of a local zamindar, lambardar or zaildar of the *Ilaqa*. It is curious to note that most of these people, too, are illiterate, and apathetic towards education. Where a literate zamindar is found, the task of enlisting students becomes easier. Local *maulvis* and *mullas* of mosques are also men of some influence, and their help proves useful in this matter. Retired Government servants should also help the members of Education Department in the carrying out of this propaganda. Further agencies, private and public like the Panchayats, Anjumans and Sabhas should also take this duty on themselves.

Teachers in the various public and private schools have been carrying on the additional work imposed on them by the adult classes. In the District Board areas they are the Board School teachers. Care should be taken in selecting the best men. The success in adult Education depends mostly on the personality of the teacher without whose enthusiasm we can expect nothing. Talk about the notability of the work is fairly serviceable in the beginning but experience shows that it can never become a lasting stimulus. A poorly paid teacher like the average honorary worker in an adult school may and does, pardonably enough, expect some more tangible reward than the goodwill of the headmaster or the approval of his conscience. For this purpose the Department has sanctioned an allowance of Rs. 5 for each literacy certificate obtained by the adult pupils. This remuneration though by no means proportionate to the nightly labour of an adult school, is likely to prove a sufficient inducement for the under-paid teacher. The characteristic of an adult school is that the work in it should be kept at high pressure. Any dilatoriness would prove to be fatal to the entire organisation. The school work should also be supplemented by lectures and clubs, for by means of these, you can hope to carry the light to a large number of people.

The headmasters and teachers have to go from door to door, mix with the people and talk to them about the adult classes and advantages of education. Many of the teachers have complained that they have thus lost

even that little regard and respect that they formally received from the public.

2. No demand on the part of the people for receiving education at an advanced age.

3. The support of the headman of the village is very often only half-hearted. He is apprehensive of the danger to his own position and authority which the spread of literacy in the lower strata might entail.

4. The poverty of the average zamindar and artisan, having no time for him beyond his daily vocation to attend a school.

5. Foolish apprehensions such as the fear of being enlisted in the army.

6. Inability of one teacher to enlist and to teach adults. Lack of interest and even pessimistic remarks of teachers and others about the success of the scheme impedes its progress.

7. Want of funds to finance the scheme on a large scale. The adult scholars do not feel it incumbent upon them to provide themselves with the bare requirements of learning such as books, takhtis, pens and inkpots. The poor teacher has to supply these things in most cases in order to induce the scholars to attend the school.

8. Cold weather, malaria, festivals, harvest, all these stand in the way of regular attendance a great deal.

9. Interruption in work due to authorised school holidays is another cause of irregularity of attendance. Some teachers or superintendents of Boarding Houses, have overcome this difficulty by making their adult schools no-holiday-schools.

In order to secure regular attendance we have to remember that the teacher's personal influence and the efficiency of his work will ensure success. If the teaching is good, and the scholars feel that they are progressing day by day, they will stay on till they attain literacy.

10. *Difficulties in testing literacy.*—On paper enrolment may be exaggerated and the amount of real work becomes difficult to test. For this purpose the system of awarding literacy certificates to successful adults has been introduced by K.B. Sheikh Nur Elahi. But even this scheme requires two precautions to be observed :

(a) The headmasters of the schools to which the adult classes are attached should see that the teacher does not present or test such candidates who were literate before joining the school

(b) The District Inspecting Staff, who are expected to hold these literacy tests should not hold a nominal test only.

Thus the progress would be tested by the number of Literacy certificates obtained by the adult pupils, and not by the number on rolls.

11. *Expenses.*--The teachers in the various schools have been carrying on this work without remuneration, while private subscriptions have hitherto sufficed to cover the cost of lights and other incidental expenses. Some local bodies are giving an allowance of Rs. 5 per mensem to every teacher taking a share in the adult classes. A small charge for contingencies would be admissible in such schools for approved expenditure.

Once the adult is literate it is essential for the organising body to keep up this acquisition and help the adult to educate himself. The statistics collected in Europe show that relapse to illiteracy is an ever present danger, and if such relapses are not rare in Europe, we may well expect them to be quite common in India, where ignorance is rampant, and illiteracy is not considered a disadvantage or a discredit by the majority of people. This danger can partially be met by opening libraries for adults. The experiment has already been tried in the Multan Division. The school libraries have been thrown open to the public. Besides, village libraries have been instituted, and the reports say that they are being used to a considerable extent.

This form of adult education is as important as the schools, for we have to remember that however earnestly we may try we cannot make all the adults attend the night schools. Moreover even if it were possible the cost would be prohibitive. But the superstitious ignorance respecting the most elementary principles of health, co-operation, general social and economic well-being in which the masses are steeped is colossal, and an effort has to be made to reduce it in order to make the lives of our countrymen healthier, happier, and more useful. In the Multan Division the members of the District Inspecting staff and teachers have been delivering a series of such lectures to the village population on subjects like education, hygiene, and co-operation. These lectures have been illustrated with the help of a magic lantern and the people have been seen to take great interest in them.

In the villages there may be profitably instituted educational clubs to which the villagers may betake themselves in the evening. The club could take in a good newspaper, and it should not be difficult to find in the village at least one man capable of reading and expounding the news of the day to the members; or for a change the village schoolmaster if there is one

might entertain the company with a useful discourse. Again, there may be some one who has travelled a good bit who will relate his experiences to widen the mental horizon of his village brethren who have never ventured beyond the limits of their own Ilaga. These clubs should not be meant only for entertainment and for keeping people amused, but also for disseminating useful information, and creating a desire for education.

We should not forget those who remain illiterate. Various methods of widening their outlook and stimulating their intelligence should be utilized. Illustrations and pictures dealing with matters of interest and importance should be made available to them.

Travelling Cinemas. Travelling lecturers for different subjects with reference to different localities may be selected. Advantage might be taken of the Red Cross Society and the Magic lantern Bureau at the Mayo School of Arts.

Travelling Libraries. These libraries would prove to be very useful if organised properly. Care should be taken in the selection of books with reference to their usefulness for the villagers. They may be organised under the management of the District Boards. The District Inspectors should organise the halts.

Street Libraries. In the towns street libraries may be opened under the supervision of the Municipal Commissioners, the cost being met by the Municipalities. Donations may also be invited.

Whatever the scheme, we should never lose sight of our great object which should be steadily kept in view, that is, educating the adults who have had no opportunities of enjoying the advantages of education.

ADULT EDUCATION.

BY L. SURAJ BAL SHARMA, B. A.,

Assistant District Inspector of Schools, Rupar.

It is needless to dilate upon the importance of adult education when all have realized how essential it is to disseminate knowledge among the masses in order to create among the illiterate population an intelligent interest in their environment and in the matters which pertain to their welfare and advancement. The decision to achieve constitutional progress by successive stages imposes

a very definite obligation upon all who are concerned with education to take all possible steps to solve the problem relating to the education of the illiterate adults. Moreover the general spread of literacy among parents should also lead to the universal education of the children and should serve to remove the suspicion among the cultivating classes that literacy is incompatible with the vocation of agriculture. In short, ignorance which is eating at the very root of our national aspirations must be removed as soon as possible. Let us therefore at once come to the practical side of the problem in hand and let us seek the satisfactory answers to the following questions : (1) How to extend and improve the provision made for the education of adults, and how to increase enrolment and how to secure regular attendance.

SUGGESTIONS.

Schools for Adults. The removal of illiteracy should be the main aim of such schools and the main endeavour should be not only to fill the schools by attracting as many adults from among the artisan and working classes in the towns and the peasants and agricultural labours in the villages as possible but also to ensure their regular attendance and continued and effective teaching so that they may attain some degree of literacy within the period of their stay at school.

Selection of Teachers. For this purpose schools should be placed in charge of such teachers as are really capable of bearing the extra burden placed on their shoulders and who take keen interest in ameliorating the conditions of the agricultural and other backward classes who have not come to realise the benefits of education.

One thing absolutely essential for the success of adult education is that the teacher who takes up this work is really earnest and enthusiastic in imparting useful knowledge to the ignorant masses seeing that they will not leave their adult schools till they have become permanent literates. Such teachers can also attract students in summer also. They should be intense propagandists and should be trained in the art.

Responsibility of Teachers. There is a great misunderstanding in regard to the responsibility of teachers in increasing enrolment of adults. The teachers think that to make the adult school a success is the duty of that teacher alone who gets the allowance. This should not be the case and the sooner this misunderstanding is removed the better. It is the duty of the teachers working in a particular area to see that the adult schools are in a flourishing condition. In order to achieve this end the inspecting officers should make all the teachers in the school responsible for bringing in adults and not merely the teacher who gets a meagre allowance. At every school an account should be maintained of every teacher's share in the

raising of numbers and any adults that leave the school should be put down to the debit side of the account of the teacher concerned. As the inspecting officer goes round, he will have before him the net result of each teacher's efforts. Negligence in this direction on the part of the teachers should also be taken into consideration in making endorsement on their certificates. The headmaster should see that the adult schools that were opened last year are reviewed as soon as the harvests are over. Inspecting officers should be directed to see that the work in this respect should be specially noted down in their quarterly tour statements as well as in their abstract. A headmaster's work should also be judged by the success his staff has achieved in running the adult school on a stable footing.

The methods of teaching adults should not be an uninspiring imitation of the instructions given to boys. As far as possible adults should be taught through the medium of what is of interest and importance to them.

The medium of instruction should suit the local conditions, but as Urdu is almost universal in the Punjab and as it is the Court Language so the aim to be kept in view will not be fully achieved if the masses remain ignorant of Urdu. But in order to create an interest in reading and writing there should be no objection if the local conditions demand and a suitable arrangement be made for teaching Hindi or Gurmukhi. And when once the interest has been created the adult will himself show an inclination to learn Urdu as well.

When we come to the practical side of the question in view it is very difficult to provide different teachers to teach different vernaculars to different students in the adult school at this stage. Therefore either such teachers should be selected as can at least teach two vernaculars or only one vernacular should be recognised and only that should be taught. The latter view will hamper progress, therefore the former seems more suitable.

The standard that might be kept in view is that about two hours' daily schooling for a period of six months, winter months in most cases, ought to lead to literacy. When the pupil has learnt to read and write well, a beginning should be made to teach him simple arithmetic of every day life. Efforts will have to be made to maintain literacy when acquired. For this purpose the best use of village libraries should be made. The teacher should take the literate adults about twice a week under his supervision and make them read newspapers such as PHUL, TALIM, GULDASTA, NAUNIHAL, pamphlets issued by the agricultural, sanitation or co-operative departments and booklets issued by the S. P. S. K. In order to rouse interest in these things it should be the duty of the librarian to prepare the field by reading selected passages of interest out of the magazines and newspapers to the

adults at least once a week. The librarian should not only read selected passages but hold discussions on some interesting topics connected with the life of the adults. Lessons on hygiene, sanitation, temperance, history, romance, etc., might form part of the curriculum with great advantage.

When an adult has made sufficient progress in the 3 Rs. a modified system of the Dalton method might be introduced with advantage as there would generally be a lot of difference among the adults as regards age, habits, and capacity to learn, etc.; the class system might possibly hamper the progress of not a few.

It is quite essential that the text-books should differ vitally from those for boys. The work of the preparation of text-books might be entrusted to a committee of experienced educationists.

The standard for adults must be easier than for ordinary day schools. Each pupil should be encouraged to progress at his own rate and along his own bent. Thus the instruction should be largely individual while the duty of the teacher should be to stimulate and to guide rather than to instruct.

(1) Books for adults should contain lessons on :—

- | | | |
|---|-----|---|
| Essentials
of good text-
books for
adults. | (a) | Personal hygiene and sanitation of villages. |
| | (b) | Scientific agriculture—easy. |
| | (c) | Duties and rights of a citizen—to enable them to give an intelligent vote at elections. |
| | (d) | Constitution of Indian and Provincial Governments and legislature—to enable them to take an intelligent interest in current politics. |
| | (e) | Lives of great men. |

(2) They should contain useful information suited to the tastes and requirements of the adults. This will foster healthy emulation and will make the night schools popular in the long run.

(3) They must differ according to the stage of development of pupils.

(4) The subject matter should concern their every-day occupations, so that they may be interested in them and derive double advantage therefrom.

Enthusiasm for night schools in the summer months should not be slackened. Adequate arrangements Sessions. — can be made for holding the classes in the open air and keeping of insects which prove a great nuisance in the summer season. Vacations may be allowed if there be a demand for them. The seasonal vacations should be fixed on the occasions of harvests and that too in villages. In villages the schools may be closed

from the 15th June and can be re-opened on the 1st of October. The great drawback of the movement is that the schools are practically closed on the 1st of April and new schools are to be restarted in October. Propagandists should see to it that the old students who did not reach the standard of literacy required in the previous sessions should join the schools and complete their course. For this purpose literacy certificates should be awarded. These certificates will attract the old students to complete their course.

How to increase enrolment and how to secure regular attendance.—these are the 2 main problems with which every one of us is confronted every year and occupied all the year round in the work of educational expansion and nowhere perhaps are these problems more acute and our efforts towards success more apt to be thwarted than when we have to deal with the ignorant, illiterate and nonetheless untractable adults that form the large majority of our population. And the greatest difficulty which we have to face is this, that illiteracy amongst the obdurate and sceptical masses is to be stamped out through the agency of persons whose influence in society due to their poor emoluments, low social standing and in not a few cases to their mercenary spirit, can practically count for nothing. They do not respond to appeals for social service and moreover an average teacher does not appreciate the course of ignorance. He does not understand that teaching is a dignified work and does not take pleasure in serving others. Hence the low and humiliating position of an average teacher in society makes the problem of adult education a very complicated one. But to make education thoroughly successful the sympathy of the people must be enlisted and demand for education must be created mostly through that very agency. The masses must be awakened to realise the benefits of education.

How to accomplish it ? The first and the foremost need is well-organised propaganda work in the press and in the pulpit. The benefits of education should filter to the masses by giving articles in papers commonly read by the Zamindars and by holding informal talks with by them by those to whom they incline to listen. Formal addresses when and where necessary will go a long way at least to prepare the ground for the successes of the movement.

Lambardars and Zaildars should also be made responsible to help the education department in this connection through special legislation. Moreover Tahsildars and other civil officers whose help and sympathies are fast disappearing since they have lost their seats on the District Boards should be made to feel this responsibility again through official pressure.

For the Lambardars, Zaildars and Safedposhs a pass in the literacy test at least should be the first condition of their being

appointed to their respective positions. Even the members of the District Boards, Municipal Boards and small town Panchayats should also be placed under this rule. A clear undertaking on their part to uphold the cause of education in their respective spheres of influence should also be taken.

Adult schools should be started in jails where the difficulties of enrolment and of securing regular attendance are absolutely non-existent.

Again industrial and commercial houses, factories, Government presses, railway workshops, etc., should be made to press their employees and to make it compulsory for them to join the adult schools attached to such places, through special legislation.

Mere persuasion as a means for recruitment has not ensured steady progress so far. Assuming therefore that all officers—including the presidents of the boards—have practical sympathy with the aims of the movement and understand its utility, to them any proposal for the education of the police constables, chaukidars, peons and other menials is likely to be accepted in almost all cases where requests are made by the District Inspectors, Assistant District Inspectors and Headmasters of the Secondary Schools to the officers concerned. I would go far as to suggest that all those who hold any license from the Municipal Committees or District Boards, for example, tonga drivers may be compelled to attend an adult school where possible. Rules can be framed to suit the convenience of such scholars.

Fee concessions in ordinary schools should generally be allowed so long as the guardian of the boy or his near relative is the student of the adult school. Of course exceptions may be made by the Headmasters who cannot possibly abuse this right being eventually responsible for the success of the adult schools.

It is said with sorrow that Co-operative Credit Societies do not always shoulder some part of the responsibility of educating the masses. They can achieve far better result than an average teacher, because their members possess a good influence over the masses and they come more in contact with them than a teacher. Therefore the Assistant Registrars of Co-operative Societies may be requested to persuade the Inspectors and the Sub-Inspectors of Co-operative Banks to encourage night school societies and to arrange for lecture and other demonstrations in order to create interest for education in the minds of illiterate persons.

Moreover the members of the District Boards may be requested to hold meetings to persuade adults to join night schools and to send their children to schools and to see that they stay there for a full period.

The Tahsildars may be asked to instruct the lambardars and zaildars to help members of the social leagues wherever they go for the purpose of disseminating knowledge among the uneducated.

The social service leagues wherever they exist should be requested to interest themselves in spreading education among adults.

The District and Assistant District Inspectors of Schools should hold meetings in each Municipality for the purpose of diffusing knowledge amongst uneducated adults.

The members of the rural community councils, the District the Tahsils and Zail committees should consider it their foremost duty to help the Education Department in this respect.

RULES TO BE OBSERVED IN CONDUCTING NIGHT SCHOOLS.

1. Only the three Rs. should be taught in these schools and the medium of instruction should suit local conditions.

2. Attendance and admission and withdrawal registers and log book should be kept as in day schools.

3. Tat frames, black-boards and other requisites of the day school should be made use of.

4. There should be no age limit for admission but juveniles are not to be admitted in these schools. Boys who have previously read but are not now reading in any school can also be admitted.

5. The school should run from 7 to 9 P. M. in winter and 8 to 10 P. M. in summer.

6. The class system should be avoided as far as possible. Instruction should be given more or less on the Dalton Plan.

7. A chart showing progress made by each individual in each month should be hung upon the wall.

8. No fees are to be charged in the beginning.

*Note :—*It would be unwise, in the first instance, to impose any hard and fast rules in regard to fees, but on the principle that what is paid for is the better appreciated, some monetary and other contribution towards the cost of maintaining the school should be expected from the pupils.

9. The adults can make use of books and takhties of the infant class boys which should be kept in school.

10. Copy of log book remarks made by any officer should be sent to the D. I. of School's office.

11. The report of the closing of the night schools should be submitted to the Office at once.

12. No teacher with a view to increase his allowance be allowed to enrol such boys in the night schools as are eligible for admission to day schools. The defaulters should be punished.

13. Attendance should be marked in the register for one meeting only.

Pay Bill.[illegible]

14. At the end of each month the teacher in charge of the night school should send the following tabulated forms duly filled up to the nearest inspecting officer:—

CLASSWISE.

Monthly Statements Sheet.

		IV.	III.	II.	I.	Those without books.	Remarks.
Total on Roll.							
No. according to religion.	Christians.						
	Hindus.						
	Sikhs.						
	Muslims.						
Profession.	Agric.						
	Non-Agr.						
	Kamin.						
Vernacular.	Urdu.						
	Hindi.						
	Gurmukhi.						

WITHOUT CLASSES.

Total on roll.	
The teacher in charge.	
Kamin.	
Non-agriculturists.	
Agriculturists.	
Gurmukhi,	
Hindi.	
Urdu.	
Total.	
Other castes.	
Sikh.	
Muslim	
Hindu.	
Average attendance.	
Working days.	
Remarks.	

The training of suitable teachers is essential. A school for adults should be an integral part of every training institution. By this means the students under training will have additional facilities in the practice of teaching adults. The training authorities will have direct opportunities of studying the important problem of adult education. In view of the fact that success in adult education will be in proportion to the capacity of the teacher to attract pupils to school and to secure and maintain their interest when they have joined the school. It cannot be too strongly emphasised from the outset that the teaching of adults can only end in failure if it lapses into a feeble uninspiring and rigid imitation of the methods employed in the teaching of children.

Libraries. The idea of the library is to provide means of general culture for the village community and to make provision for general reading in particular, so that the pupils shall make use of their lately won literacy for beneficent and beneficial purposes. It is a hopeful sign that in most districts the provision of such libraries has been made in all upper and lower middle schools. In the Ambala Division this task has been accomplished in a very thorough fashion. All furniture which has been supplied to each school is simple in design but strong in construction which ought to be the case because equipment is the crux of the whole matter. The other very important needs to be fulfilled are :—

(1) The books in stock should suit the local conditions in language and subject matter.

(2) The books should suit the age of the pupils. Provision should be made for boys as well as for adults.

(3) Books for adults should suit their taste.

*Note :—*In this connection I beg to point out from my own experience that apart from books dealing with scientific agriculture, personal hygiene, co-operation, sanitation, temperance, the provision of books dealing with the lives of great men, *e. g.*, Life of Asoka, Life of Guru Nanak, Life of Mohamad, Life of Christ, Life of Ram Chandra, etc., and books containing historical ideas and stories, interesting geographical phenomena, *e. g.*, ways of living of different peoples inhabiting this world of ours, and moral stories, should also be made.

(4) The language of the books should be easy.

(5) A provision of a separate room for the library should be made.

(6) The library should be supplied with pamphlets and journals dealing with matters of general interest and importance, published by the beneficent departments.

Librarian. Much care should be taken in the selection of a suitable librarian. He should not be such as shows little or no bent for this form of work. He is intended to assist men who have some understanding of the spirit of the adult education movement. Preference should be given to young men coming out of some of the normal schools such as Gakkhar and Gurgaon. Ordinary J. V.'s are unfit. Attempts should be made to put S. V.'s in charge of libraries.

Duties of the Librarian :

(1) Should hold discussions with and deliver lectures on the following topics to the adult students at least once a week :

On the most important developments in agriculture and hygiene, science, on the breeding and care of cattle on the methods of combating and preventing the common ailments and diseases, on the value of co-operation, and the elementary principles of civics and administration.

(2) Should do intense propaganda work in making the library popular specially among adults.

(3) Should read selected passages of special interest to adults at least once a week.

(4) Should keep a catalogue and register of books.

(5) Should send to the A.D.I. of his Ilaqa a list showing the number of men who come to use the library, showing the number of books issued to the people and showing the number of lectures, with the names of topics, delivered by him every month.

(6) He should keep in his diary the summaries of the lectures delivered and should show them to the inspector at the time of inspection.

(7) With a view to ensure a regular use of books and an effective control on the work of the libraries, a register in the following form should be maintained in each library :—

Date.	Name of the book studied.	Signature of the person studying.	Initial of the librarian.
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The object of a systematic campaign of the Inspecting Officers and school masters is not only filling the existing schools with additional scholars but also opening new schools for adults. There is an ample field for this work. At least no upper middle or lower middle school should remain without an adult school attached to it. Efforts should be made to attach adult schools to flourishing primary school. In addition to this retired teachers or private agencies

Need of
New
Schools.

should be encouraged by liberal grants-in-aid to open adult schools in such villages as have no schools for boys. These schools should be put under the Headmaster of the neighbouring boys' school and the use of the neighbouring village libraries should be made accessible to them.

The allowances for men who conduct such schools should be more liberal than they are at present. The allowances given are meagre and insufficient.

Responsi-
bility of the
Government

It is very difficult to lay down very hard and fast rules as regards literacy tests. Regarding the time, much will have to be left to the discretion of the Inspecting Officers. These should be held wherever and whenever practicable. For a pass in such tests practice in the application of common rules in arithmetic and a working knowledge of reading and writing should be considered sufficient.

Literacy
Test and
Certificate s.

ADULT EDUCATION.

BY MAULVI MOHAMMAD NAJIB ULLAH, B.A.,

Government High School, Akalgarh.

Some special difficulties and their solution.—There is no doubt about the importance of adult education. It is essential for political reforms and self-government. It chiefly aims at dispelling the ignorance in which masses of the province are immersed. There are thousands of our countrymen who are uninformed even of the most elementary principles of health, co-operation and general, social and economical well-being ; and effort must be made to break down such colossal ignorance to make them healthier, happier and thrifty.

Most of the Zamindars are sunk in the pernicious customs of the worst kind. It is no uncommon scene to see 4 or 5 dancing girls hired at a time for hundreds of rupees by an ordinary Zamindar on his son's marriage, and to pay them, he has to borrow a heavy loan from the village *Sahukar*, thereby committing himself to his clutches for the whole of his life. Some are hopelessly given to drinking and they not only go on mortgaging their land in pieces, but also irrevocably injuring their physique and health. Others are apt to quarrel with their brethren on the most trivial matters and they carry on litigation till both the parties are bankrupt. Now it is the duty of philanthropists and their enlightened brethren to reclaim them from such ignorance and illiteracy and to assist them to lead saner and more useful lives,

so that they may understand matters which concern them and their country most vitally. Night schools for adults are the cheapest agency to combat this evil.

It is generally observed that education of children in villages is not keeping pace with educational developments in fairly big towns and cities. This is again the matter which affects the nation as a whole. The chief cause of this drawback can undoubtedly be attributed to the general illiteracy of the parents. When I say this, I speak from my personal experience as the Head Master of a Middle School, located in a typical rural area. In spring and autumn season, we receive heaps of applications from the guardians of students to grant them leave from 10 to 15 days for attending marriages of their relatives—no matter how distantly related they may be—and whether you say yes or no off they go, one and all, on their intended tour, and return after 10 or 15 days quite sick and worn out. An educated father on the other hand fully realises what a deep gap in the studies of his son it means if he absents himself from the school even for so much as a single day. He not only regularly sends his boy to school but also lays down a definite time-table for him to sleep and rise, to take his bath and breakfast and for play and study. He takes particular care that his son associates with good company, and reads useful books in his leisure time. He sees that his time is proportionately divided between work and play, so as the days pass by, he grows up to be a healthy young man of good physique and sound mind. Hence, if we persist perseveringly in the cause and spread of adult education, I am sure, the day will not be far, when the general spread of literacy among the parents will not only lead to the universal education of children, but would also impel them to supplement the work of day school as mentioned above.

A satisfactory beginning has been made in the past three years. About 25,000 adults have been enrolled in these schools, but the distressing aspect is that the literary certificates issued to them, hardly number above a thousand; and even then it is open to question if many of these so-called literates have retained the capacity to read and write and have pursued their search of knowledge afterwards. There are a very few such instances and the majority have either relapsed into illiteracy or are on the high-road towards it. So the net profit reaped so far by this scheme, though by no means discouraging, is not what we aim at, and for this, some special difficulties are responsible, which I enumerate below :—

1st Difficulty . Apathy to Education.

There is absolutely no demand on the part of the people for receiving adult education. In India, inability to read and write is not considered a disadvantage or something affecting their discredit by the majority of the people and so they are amazingly apathetic towards the benefits of education.

In the past, the headmasters and their colleagues had recourse to every possible method, direct or indirect to enlist the scholars in adult schools. They went in each Mohalla from door to door, but very frequently they found the doors locked upon them from inside. They hired *Mullahs* to preach to them the gospel of education and their sermons proved to be equally futile. They requested Lambardars and Zaildars to help them, and they lent some help half-heartedly, being apprehensive of the danger to their own position and authority which the spread of literacy in the lower strata might entail. They invoked the aid of Tahsildars, Naib-Tahsildars and Zaildars to exhort the people and to bring them round by their personal influence and authority but a very few from among them took up the work in right earnest, for they possibly in some cases at any rate dreaded lest their own income should be curtailed in proportion to the general enlightenment of the masses. They with the help of Municipal Commissioners and some other leading men of the town got the people to assemble at one place, had informal discussions to bring home to them the benefits they would derive from education, learnt their difficulties, offered their solutions, and after several hours' worry succeeded in extracting from them a promise to attend the school which promise alas, was never or only partially fulfilled.

Another easier course adopted in some places is that the headmaster receives an order from above to start a night-school in his village. He calls a staff meeting and reads it out to them. One of the J. V.'s (who are generally very submissive and for whom, underpaid as they are a monthly allowance of Rs. 5 proves a sufficient inducement) takes up the job. He gets a register from the office, goes off to his home and puts down on roll the names of all his associates. At night, he takes a round in each Muhalla knocking at doors and talking to people of his intentions to educate them, and they, not knowing what they will get at the adult school, follow him merely for the sake of curiosity. There they read for 2 or 3 days simple letters combinations and then return home more apathetic to education than ever.

I am of the opinion that before starting adult schools, the people should be fully convinced of the value and the advantages of education, and this can most effectively be done by the educational authorities in the inspection line. While on their tour in villages inspectors can easily call afternoon meetings of Zamindars and give them lectures and hold discussions on matters which concern them most vitally, *e. g.*, improved scientific methods of agriculture, cattle breeding, selection of seeds, village sanitation, personal hygiene, care of children, education and its value, co-operation, civics and constitution of councils, assemblies, etc., and to drive the facts home; at night the same should be presented to them graphically illustrated on the screen by a magic lantern. When the interest of the audience or spectators has been roused

to the highest pitch the inspector can tell them with advantage, "What you have heard this afternoon, or seen on the screen is a mere glimpse of the vast treasures hidden in books, which you can easily search for yourselves if only you are able to read and write ; and this capacity can easily be acquired within a short space of six months, if you are in right earnest to do so. Now let me see how many of you are desirous of being educated. For your convenience I propose to open here a night school and such and such a teacher will teach you free of all obligation or contribution on your part. Those who wish to profit please stand." I am sure such a sympathetic call will never pass unheeded, and there will be not a few to respond to it promptly. Now the best and the ablest member of the day school staff should be called upon and told, "Look here Mr. so and so. I place you in charge of this night school. There are so many men ready to enter your school. Now it is for you to take to your work enthusiastically. On my next round, I wish to see at least 75 per cent. of them fit for award of literacy certificates," and thus will end the first difficulty.

2nd Difficulty : Casual attendance.

The chief excuses brought forward for absence are festivals and marriages. Some are sick and fear cold, others plead distance. Some are too tired by the day's labour, others too busy to spare time. Whatever the cause of absence may be, it is certain, that either the interest taken in other things far exceeds the interest in education, or the benefits derived at school are too inadequate to compensate for the trouble which they take in coming over to school ; and for this, the teacher is solely responsible. The success of an adult school mostly depends on the personality and the general behaviour of the teacher, and nothing can better ensure regular attendance than his personal influence and efficiency. If teaching is good and the pupils feel that they are progressing day by day, they will stay on till they attain literacy. If, on the other hand, instruction is ineffective and the progress slow, he will come out with contemptuous opinion of literacy, education, school and other cognate vanities.

3rd Difficulty : Scarcity of teachers.

Success in adult education will be in proportion to the capacity of the teacher to attract pupils to school and secure and maintain their interest when they have joined the school. Hence the means and methods of teaching adults should form a special feature of the course of instruction to all the teachers under training. It cannot be too strongly emphasised from the outset that the teaching of adults can only end in failure if it lapses into a feeble uninspiring and rigid imitation of the methods employed in the teaching of children.

Now-a-days, the teaching is mostly conducted by middle passed J. V.'s who have many limitations. I think that the

teaching should be done by the senior and the ablest member of the day school staff and his time spent in adult classes should be taken into calculation in determining the number of the teaching periods, demanded of him during the day. Exceptionally good work should not be considered fully compensated by a meagre allowance of Rs. 5 per mensem, but should be regarded as legitimate ground for claiming special promotion.

4th Difficulty : Dearth of suitable readers.

The only books available at present are those prepared for children in schools and it is obvious that text-books written for the young are, both on account of their subject matter and on account of their elementary style, little suited to the adult, who, though illiterate, has a more advanced intelligence and greater experience. Therefore special readers should be prepared which should contain besides moral stories here and there, easy lessons on the following important subjects :—

(a) Public Health and Personal Hygiene.

Cleanliness of person, home and village ; ventilation, wells and water supply, common diseases, how to avoid and how to remedy them, accidents, first aid and simple dispensing.

(b) Case of Children.

(i) In the case of babies cleanliness, food, clothing, common ailments, infantile mortality, its causes and remedies.

(ii) In that of the youth, good citizenship and scouting.

(c) Agriculture.

Improved methods and implements, manures selections of seed, care of cattle in health and sickness ; improvement in breeds, and value of veterinary hospitals and Demonstration Farms.

(d) Education and General Knowledge.

Selected topics dealing with peoples and activities in other lands, outstanding periods and events in the History of India. The rights and obligations of citizens, educational hobbies, etc., etc.

Long ago, our Inspector had foreseen this difficulty and to meet this demand, he has compiled two books, Rafiq-i-Zamindar, Parts I and II, which are written in very easy and simple language, so that even an ordinary villager can understand it without much difficulty. These have been greatly appreciated by both teachers and pupils wherever they have been introduced

and have materially helped in the successful maintenance of adult classes. But if the organisation is to expand, a wide series of extensive readers is wanted.

5th Difficulty : Method of Teaching.

It is clear that the method adopted to teach children is quite inadequate for adults. The following are a few suggestions for its improvement :—

(i) It should be rapid in progress, for nothing to an adult is more disgusting than stagnation.

(ii) Primers with its uninspiring lessons should altogether be dispensed with. The elementary work of recognising letters and their simple combinations should be done from the black-board and as soon as the scholars can read simple words of two or three syllables, they should begin the First Adult Reader.

(iii) Knowledge of the simple rules of arithmetic should at first be imparted by continuous oral practice in solving questions of every-day life.

(iv) When once the rudimentary ground work has been covered, the teaching should be individual. No one in the world is exactly like another, not only in outward form and feature, but also in that mysterious blend of habits, thoughts, feelings, sentiments, reactions and motives that make up the personality. Not all have the same aptitudes, yet they are taught the same subject in the same way and at the same time. The clever are retarded and the dull are exercised beyond their powers. The work falls mainly on the teacher and initiative power of thought on the part of the pupil is absolutely restrained. It is only by self-activity, by our own dogged thinking and planning and doing that intellectual progress is attained.

6th Difficulty : Finance.

No scheme however important can be pushed on without money and the only thing I can say with respect to this is that the spending bodies concerned may be persuaded to regard adult education as an object more worthy of their liberal expenditure than other objects upon which they are spending so lavishly.

A few words more and I have done. The preliminary task of starting adult schools should not be regarded as accomplished until it has succeeded in placing within reach of every adult, the means and equipment necessary to enable him to pursue his search for knowledge for and by himself. So the second and more important function of the adult education, then, is to assist the people to educate themselves. For this purpose, small but useful village libraries should be instituted where the villagers may resort in the evening and continue their private study under the

direct supervision of the librarian, who should not only be there to remove their difficulties, but should also read out to them interesting passages from good newspapers and pamphlets and sometimes entertain them with a discourse on one of the important subjects mentioned under the head "Readers."

It is also essential that those who remain illiterate should not be forgotten altogether. Various methods of widening their horizon and stimulating their intelligence readily suggest themselves. Illustrations and pictures with matters of interests and importance should be made available to them. Much can be done by this means and discourses to bring to the knowledge of the uninformed the most important developments in agricultural and hygienic science, in the breeding and care of cattle, in the method of combating and preventing common ailments and diseases, in the value of co-operation and in the elementary principles of civics and administration. The main object in this as in all measures for the education of adults, should be to afford to those who have not been favoured with opportunities to benefit by the advantages of education in their younger days, means whereby they may learn through the eye and ear that which will enable them to become better and more useful citizens.

THE TEACHING OF ENGLISH IN COLLEGES.

BY H. Y. LANGHORNE, M. A., I. E. S.

English occupies an extraordinary position in all the machinery of education in India. Nowhere else in the world, even in England itself, or in any of the English-speaking countries, is English given the same predominance as in the curricula, courses, and time tables of India. It is, as you all know, the one universally obligatory subject.

The political connection between England and India is not the only cause of this predominance. English is now established as a bond of union between the various languages of India, and as the means of communication with the rest of the world. The intellectual trade of India, both export and import, and much of the internal commerce also, goes on in English, and so it is that the position of Indians in all Indian affairs, and the position of India in the affairs of the world is bound up with a knowledge of English.

For these broad reasons English must always be a study of first-rate importance in India, but the fact remains that it is a foreign language, based upon alien ideas, and it seems to me that there is a danger of a grave mistake being made if we allow the foreign tongue to usurp the place of the mother-tongue in our schemes of education.

Let us see what representative committees in England say about the relative positions of the mother-tongue and of foreign languages. "English for English students is entitled to paramount rights and is necessary as a preparation to the study of foreign languages, which are, in their turn, subsidiary to the study of the mother-tongue." (See *Modern Language Teaching in England*).

"The fundamental necessity of English for the full development of the mind and character of English teaching, and the fundamental truth that the use of English does not come by nature but must be taught." (See *the Teaching of English in England*).

It seems to me that in the Punjab we have made the foreign language paramount, and have neglected the mother-tongue, and that is why our progress in the more advanced teaching is so unsatisfactory. If we disestablish English as the one obligatory subject and restored that paramount position to the mother-tongue we should, I believe, be doing much to assist the mental development of our students, and by so doing we should assist them not only in English, but also in every other subject.

I would make the mother-tongue the centre of secondary education—what that tongue is, how it should be taught, and what work should be done in it is not my business to say. My business is English, and it is as a teacher of English that I have been led to this position, and it is as a teacher of a foreign language I have come to the conclusion that some of our difficulties arise from the neglect of the mother-tongue, for, as the English Committee puts it, the term "Language" is almost convertible with the term "Thought."

However, let us see what is done in English. Roughly, every student spends six or seven years at school, and four more at College learning English and during all that time English dominates his working days.

His work is tested at the end of his school days, and at the end of his college career.

The *Punjab Educational Journal* of July 1926 has a review of the Matriculation results and the writer declares that "the percentage of English passes (70·7) is higher than appears to be justified by the everyday working knowledge possessed by the average matriculant:" and further, "we do not believe that 70 per cent of the candidates know enough English to benefit by a college career."

These statements are merely a particular instance of the common complaint that the matriculant is not up to the work before him; a complaint that is made by almost every Professor in almost every subject: echoes of which reach us from every office and

profession : and they indicate the existence of a serious gap between schools and colleges. But disregarding this gap, we find that 70 per cent. pass and 30 per cent. fail, and that though the matriculation is an easy examination, for its aim is to be, not a barrier for the active to clear, nor a sieve to sift out the incompetent, but a test and a proof that the boy has completed his schooling satisfactorily, and be it remembered, only 33 per cent. of that test is demanded.

Translate this percentage into actual figures and we find that about 6,000 fail annually ; and what is more, by general consent the third division boys are not fit to follow a lecture in English, i.e., another 8 per cent. or 1,500 more ; and of the remainder we do not believe that many are fit to profit by a college course."

Let us put these figures in the homely traditional way of annas to the rupee, and see how our educational currency is depreciated. 5 annas in every rupee are not fit for acceptance ! Or in yet another way—we have 254 High Schools and one-third of their pupils do not reach the required standard : it would indeed be startling if we found that 85 of these schools were totally inefficient, which, statistically speaking, is what it amounts to. But do not think I am using the schools to distract attention from the colleges—far from it. The two are supplementary : the faults of the one continue in the other, and in all fairness, let us of the colleges admit that the foundations of our work are all laid for us. Yet the state of things at the intermediate and degree stages where we next catch sight of our pupil is no better. Approximately 45 per cent. fail at each examination, and I strongly suspect that it is either in English, or through English, that most of them come to grief. If anything then, the colleges are worse than the schools.

Is it the examinations that we should blame ? I do not think so. Faulty they are....it is impossible for anything so unwieldy as the Matriculation to be much else, but blaming the examination for the failure of the pupil is not very logical : when all is said and done, the examination is only a bit of machinery, a means to the end of Education, and a man is just as well educated whether he parts with his fee to the University or not....and whether he passes or not....and whether the examination exists or not. Just as *well* educated, I said, but I might have said, just as *badly*, and badly educated these six thousand boys must be to fail as they do, and badly educated they are, even if they never go into the examination hall at all. It is no use blaming the students either. They are gathered into a system, which, mathematically speaking, ensures that large numbers shall fail, and they cannot themselves. The fault is not theirs, nor is it that of the teachers. We have plenty of faults, personal or professional, but far be it from me, a teacher of English speaking to his colleagues and partners, to impute blame to my fellow workers : what I do

blame is the system of English teaching into which all colleges, schools, teachers and all have allowed themselves to be entangled, and for accepting a situation which is clearly and admittedly wrong without attempting to improve it. This is nothing else than "holding a candle to the devil" a pretty job for education.

Various improvements can be made.

First of all in the qualifications of the teachers in High Schools

Who and what are the men responsible for English teaching ? Chiefly the graduates who figure in Table VI of the D. P. I.'s reports—1,362 of them in High Schools, an average of $5\frac{1}{4}$ per school an average that has increased during the past 3 years by the magnificent amount of $13/100$ ths of a man, about twenty pounds avoirdupois ! a total increase of less than 50 men, and that in face of an increase of students of graduates of 16·7 to 17·9, and with the swelling tide of increased primary pupils rising daily.

Of these $5\frac{1}{4}$ graduates per school, one is certainly the Headmaster and one the Mathematics man, one probably the Science man, so that even supposing each graduate in a school contributes a good share of his energies to English we can see that the teaching of English in the Punjab does not receive much support from the graduates.

There are not enough men of this minimum, this not very satisfactory qualification of B. A., Punjab, at work in the schools.

But English starts in the middle classes. There the graduates are a drop in the ocean, 1 to every 350 boys. Who then teach the middle classes ? Failed B. A.'s, F.A.'s failed, F.A.'s and Matriculates ; truly the blind lead the blind. Is it to be wondered at that the high school staff fail to bring more than half their boys up to 35 per cent. of the matriculation ?

But further, if we double or treble the graduate staff at once, would there be as much improvement as there ought to be ? I think not ; and the reason seems to me to be that such few graduates as enter the profession—an average of less than 100 a year (a number almost exactly equal to the annual loss) are not properly equipped for teaching others. Do not misunderstand me. So far as I can ascertain their intellectual quality is good, and their training is stimulating and inspiring : it is their education that I think has been inadequate. Their B. A. courses, and M. A., too, were unsuitable for increasing their mastery over the English language, and the methods of teaching and learning in colleges, unsystematic and unscientific as they are were positively harmful. There the teaching is almost entirely text-book reading. I doubt if any future teacher has ever attended a genuine lesson in the language he will have to teach, and it is hardly to be expected that he will diverge from the customary methods when he himself begins to teach : a young teacher is almost certain to reiterate the style of teaching by which he himself was taught.

What happens in this text-book lecturing? Well, as you all know, it is chiefly a matter of "making attendances," and sitting still for the boys, and of reading aloud, with occasional side-slips into paraphrase and synonym-hunting for the teacher. I believe if the University ceased to insist on roll calls, most of the boys would refuse to waste their time in attending. I have heard it described by a distinguished Principal as "hack-work", and that though it formed the chief operation of his college, occupying 2 to 3 hours a day of his crowded time-table! Now, it seems to me that the persistence of this mischievous system is due partly to custom and partly to a false economy.

The custom is, of course, that instruction in a college is given by lectures to assemblies of listeners. Now, lectures are the approved method of studying those subjects where the professor's work, learning, culture, originality and personality, can be brought to bear, and probably literature can be handled only in lectures. As the Committee on the teaching of English said, "literature cannot, and should not, be *taught*—it is to be communicated in such a way that the student will *experience* it rightly," and, as an interesting corollary we may note that the committee who framed the Civil Service Regulations in England (consisting of the Professors of Oxford, Cambridge, Manchester and Newcastle declare "they were unanimous on the difficulty of *examining* in Literature."

On the other hand, if in studying literature the Professor is more important than the student, in learning a language success depends upon the industry, practice and creative efforts of the pupil. It is practice, and again practice, and once more, practice which enables a man to master a language and therefore the place to learn it is a practical room, a Laboratory, and *not* a Lecture room.

The University has laid it down that a practical class in science shall not exceed 20, and I understand that some thoughtful teachers consider this too many.... I am sure it is too large for practical work in English. We need more laboratory work and fewer lectures. Remember that learning a language and learning other subjects are on different bases. For some years, at any rate, other subjects are matters of information, observation and knowledge accumulated by generations of workers. They might be called the *objects* rather than the *subjects* of study—but language is "the medium of thought, if not the very stuff and process of it.... it is the mind of the student.... almost the student himself," and consequently we have to work on the mind of each pupil our laboratory table is the pupil himself, and the mass lecture is the very last place in which we can approach the individual as he should be approached.

The lecture, as I said, is appropriate to the study of Literature, but not one in a thousand of our matriculates aims at that study. He may, in a very few cases, desire that in the M. A. classes, though my experience is that the M. A. candidate is after the degree for what it is worth in life rather than for what it represents as a study. There is no crime in that : the crime is in giving the pupil a stone when he asks for bread. What he wants, and the M. A. student as much as anybody, is a mastery of the language as a means of communication. A large majority of serious students require English for reading purposes only, for reading books and for reading newspapers, for getting into touch with the minds of others : very many require enough to write such official communications as fall to their lot in their particular and limited sphere of action in after life ; “ the undersigned has the honour to call to your attention his Memo. 2143 of the 13th ultimo and to be favoured with a reply on form 698D as per margin ; ” thank heavens ! we have not yet sunk to that level yet and our pupils have to learn the particular jargon of their particular office on the office stool. Those who go further require English as a means of spoken communication, and for this they receive no training : while those who aim at superior appointments get a course of critical study in the masterpieces of master-minds, a most difficult and subtle form of training, without ever having had any systematic education in the language in which those masters have spent their highest endeavours of expression : and so we get the barren study of other people’s criticisms—as if a deaf man should study music by reading what other people have said it meant for them. As Professor Ramsay Muir has said, “ the critical study of classical pieces is not favourable, but hostile, to a working knowledge of the language.”

That there is common ground between the study of a language and the study of its literature is certain : it is also certain that the one is built and can only be built, upon the other ; and until the foundations are well and truly laid the superstructure cannot stand and how the foundations are laid we have seen. Some survive our methods, but at what a cost ! What a slaughter of the innocents ! what a waste ! When we have cleared up the confusion between Language and Literature, and between Lecture and Practice, in the colleges, we shall be in a position to improve the whole position of English teaching, and to build up a satisfactory course in English Literature for those rare but valuable minds, to whom such studies are a delight. Meantime, “ the hungry sheep look up, and are not fed.”

Let me recapitulate the causes I have suggested as responsible for the weakness in the *schools*.

1. The neglect of the mother-tongue and the consequent stunting of the mind of the student. You might as well deny a boy his mother’s milk, and expect him to grow up healthy.

- II. There are not enough teachers possessing even the qualification of B. A. in the High Schools.
- III. The first four years of English teaching are in the hands of teachers not fit for this work.
- IV. The graduate teachers have not had an education or a training suitable for giving them a hold on the language themselves, or for imparting it to others.

And the causes of weakness in the *colleges* seem to me to include all of these and other faults peculiar to college teaching.

First of all, the colleges cannot supply improved teachers who might raise the educational level of future generations because the school teaching continues to send up unsatisfactory material.

Secondly, they cannot break away from the traditional habit of text-book commentary because they are understaffed, and so they send out men with an inadequate education to cope with the ever-increasing numbers of schools and pupils. And so the vicious circle revolves !

We often hear laments for the good old days when the teacher sat under a tree and his pupils gathered at his feet, and it seems to me that the popular instinct is right in this matter. Not for the reasons usually advanced however : the old-fashioned simplicity is gone : and it is a mistake to attempt to revive it. What I believe people really miss is the personality of the teacher : we have substituted mass-production methods for the personal relations between the experience of age and the keenness of youth, and the result is unsatisfactory. Something of that personal relationship between " guru " and " chela " could be recovered by an increase in staff in the colleges. We require far more teachers in the colleges for English. The proportion at Government College is about one man per hundred students in six or seven different classes, and I doubt if any other college is better off. Inherited custom has much to do with this evil, but I sometimes wonder if false economy is not to blame also : the economy of supplying inefficient education because the money of the parents is saved and the unpopularity of increased fees avoided at the cost of the individual student's failure : and the economy of financing a Science side at the cost of understaffing the Arts Teaching. The remedy is costly, but set on the other side of the account the cost of the time, effort, brains and hopes, denoted by the thousands of failures in every examination. How many times do we hear of a boy talking of " a year of his life being wasted " if promotion is missed ! It is the years before that have been wasted indeed, but it is a grievous thing to be said.

The remedy is costly, but it is also obvious—more teachers and of a better quality, in the colleges, as in the schools.

With increased staff we could set about substituting practical work in English instead of text-book reading to large classes, and I think we should feel the benefit not only in English but in every other subject taught in college. More than this I cannot suggest without opening up a very large subject, that of training future teachers.

Our young M.A.'s now go forth to do what they can in schools and intermediate colleges without any training except what they can get at the Training College and many of them without that. I think they should have a much longer and more thorough training than this, and with all respect to the building in which we are this day collected and to the energy and knowledge of those by whose invitation we have come, I am doubtful if a Training College is altogether suitable for such a training. Certainly not a training college where life is so short and so intense as it is here. Teaching at a Training Institution seems to me to be to some extent unreal. We all know the magic that resides in ownership of land, and I feel that ownership of a class and responsibility for its progress is a prime necessity in teaching. There is an artificiality of lessons given as they must be in a Training Institution, and a teacher cannot feel the vital stimulus of responsibility in a practising school.

Can future teachers be trained elsewhere? Can they be trained at the same time as they teach? And can they be taught at the same time as they teach? The suggestion is not altogether absurd: for all men learn by teaching, and teachers, no less than carpenters or any other practical men, learn by practice of their trade. Now there *are* classes in the colleges which are in need of more teachers, and these are the junior intermediate classes. Could the teaching in these classes be given in such a way as to combine instruction to the students and practice under supervision and control for the teachers, and also in such a way that the instruction to the students should be given in smaller "practical" units as I have suggested above, while the teaching given should be part and parcel of a course of training for the teacher, which should fit him to go out to work in schools or intermediate colleges after his course is complete. I have been led to this device, (which is only the old plan of pupil teachers in another guise), by the difficulties of providing for junior classes at Government College. I cannot get men enough for the work and at the same time I hear of pupil after pupil of my own obtaining places, where they will be in similar responsibility, on the strength of having done fairly well in the English M.A. of the Punjab University, an examination and an education which has really little bearing upon the work they have to do.

If such men could form their teaching habits under the eye of experienced men following regular course of teaching in real conditions, I think they would be far better fitted to become teachers, and their future pupils would be better taught than they are now.

Such men should be paid and their services counted towards seniority and pension but I would not hold them under any bond or security for fear that a good man might hesitate to join when he had hopes of getting a better job later on. Their class-work would be planned beforehand, approved and delivered under supervision, and it is clear that any such scheme makes severe demands upon the senior staff for supervision and control, especially until the work is systematised. At least one, and probably two men would be needed to manage this work, and a class should consist of 6 to 10 men. On lines of this kind I can conceive of my own college supplying 8 or 9 men a year towards the public demand, at the same time improving the work within the College. But after all, it is an insignificant attempt. If ten or a dozen filter into the Intermediate Colleges and High Classes during a year, how long will it be before their effect is felt? and what are they among so many? Well, I can see no other direct means of improving the teaching of English, and it is remarkable how such meagre beginnings do develop.

If I have spoken more about the teaching in schools than upon the titular subject of this paper. "The Teaching of English in Colleges," it is because I believe that they are inseparable; the distinction is accidental, not essential: the methods in colleges should not differ from the methods in schools: the faults of the one are the faults of the other, and improvements in one will result in improvements in the other. An increase of staff in the Colleges with improved teaching along practical lines will influence the next generation of teachers upon whom the next generation of pupils depends, and so, or at least one may hope so, they will come to college a little—it may be a very little—better grounded than they are at present, and the first step towards general improvement will have been made. A minute step perhaps: but in the right direction, but since the work of the teachers of the middle classes seems to me inseparable from the work of the teacher of the B.A., it is necessary to eliminate the faults of both simultaneously; to leave one link weak is to weaken the whole chain; our work as teachers of English, in schools and colleges, is teamwork, and it should be considered as a unit.

It is a very big unit, growing in size and complexity, and therefore in cost, every year: when you deal in thousands of pupils you must be prepared to deal in lakhs of rupees, but costly though it is, good education is not so expensive as bad education, and if I am right in my interpretation of the figures, then I think, you will agree with me that our scheme of systematic failure is in need of a complete overhaul.

Can we continue to "carry on" as we are doing? The numbers of students increase every year, and with the tremendous impulse to Primary Education, the rate of increase in Secondary is bound to speed up. Are we satisfied with the present state of things? Or is the whole of our machinery out of date?

FRUIT CULTURE AND PRESERVATION.

BY S. LALL SINGH, M. Sc.,

Fruit Specialist to the Punjab Government.

Unemployment.—One of the acutest problems confronting our nation at present is the unemployment of the educated classes of people. We hear of unemployment from every Province of India although in some Provinces like Bengal and Madras it is much more serious than in Provinces like Punjab where our graduates are still able to get some sort of job—even though it does not exceed rupees fifty a month in many cases. But the Punjab must also be prepared to face this problem because every year that rolls by adds hundreds of graduates to an already long list and the number of new openings cannot keep pace with the number of new graduates turned out by our University every year.

Vocational Training.—It is fortunate that the public men of India are unanimous in not only regarding unemployment as a serious problem, but are also almost unanimous in their conclusions that the time has come when our present system of education should be supplemented with some sort of vocational training that would enable our youths to earn their livelihood. No doubt here and there one finds some diehard educationists who still oppose the introduction of courses of practical utility in our colleges and schools. They contend that the object of college education is something more than earning of livelihood, i. e., development of mind. In their opinion education for education's sake, irrespective of the extent of its practical utility, must continue to be the motto of our colleges. I do not wish to be accused of underestimating the value of present day education, but while appreciating its value I cannot forget that India is perhaps the poorest country in the world and millions of people are living daily on the verge of starvation who have never known in their lives what a full meal is. Although our *per capita* income is hardly 5 per cent. of what it is in countries like the United States of America, yet I can say from my own personal knowledge that even in an enormously rich country like America where people can afford to get education for education's sake the question of practical utility is never lost sight of in educational institutions. And I maintain that in a terribly poor country like India one of the

main objects of education must necessarily be to equip our young men and young women to earn their livelihood in after college life. This is possible only if our present day education is supplemented with some sort of vocational training. I can enumerate several courses worth introducing in our colleges that, besides their practical utility, can be depended upon to develop the minds of the students as much as many of our present courses do.

Fruit Preservation Course in our Schools.—This evening I shall explain how surplus fruits and vegetables are presented in tins and jars in seasons of plenty to be utilized in season of scarcity and supplement it with a practical demonstration. I have no doubt that a fruit preservation course if fitted in our system of education can be of immense help to everybody in household economy which is the urgent need of our young men who find it increasingly difficult to make both ends meet with their petty salaries. Such a course may even enable some students to start a decent business with a small investment.

Development of Preservation Industry in California.—The art of food preservation is unfortunately very little known in India. For the proper appreciation of the subject and its importance, it seems advisable that, as an introduction to my four demonstrations, I should take a few minutes of your valuable time to picture to you what other countries have done. No doubt some of the European countries have accomplished wonders and I could have taken some European country for the purpose of illustration. But knowing how averse people usually are to everything second-hand, whether second-hand furniture or second-hand information, I prefer to take the examples of the Hawaiian Island and the United States of America, as with my nine years' stay in America I can, with some confidence, draw upon my own personal knowledge. To show the extent of the rapidity at which this industry is being developed in the United States of America it may suffice to mention that California State (one of 48 States of the United States of America), with climate not very dissimilar to ours and having only about 12 per cent. of the population of our province canned in 1910 about 23 lacs of boxes of fruits (each box containing 24 cans of one seer each worth over 2½ crores of rupees, while in 1917 the number of boxes of canned fruit rose to one crore of which 50 lacs were of peaches alone. Similarly the amount of vegetables canned in 1908 was 15 lacs of cases worth 12 crores of rupees which by 1914 went up to 30 lacs of cases and in 1918 jumped up to about 83 lacs worth about seven crores of rupees.

Preservation Industry in Hawaiian Islands.—Much more surprising than this even is the story of Hawaiian Island (especially Honolulu) a group of small Islands near the coast of California which I was able to see on my return journey to India for about two hours' time by motor. It was only in 1889 that the United States' Government brought over Honolulu from the Spanish

Government for a petty sum. In 1899 Mr. Dole of Boston came over to this island in search of some land for a homestead. He grew a few acres of pineapples and soon realized the possibilities of this industry. In 1903 he organized a company and started a cannery with a capital of about sixty thousand rupees and shipped about 1,800 boxes of canned pineapple. In 1920 this company alone shipped out 18 lacs of boxes of canned pineapple worth several crores of rupees while the total output of *all* companies in 1920 was 60 lacs of cases worth about nine crores of rupees, the total area under pineapple being 46,000 acres. The output of one of the canneries of a California packing corporation which cans pineapple from 10,000 acres is 7 lacs of cans per day. The American company supplies empty tins or cans to these canneries and one of its can-making factories has a capacity for manufacturing one lac of cans per hour.

Another very interesting thing in these canneries is that practically all the operations in pineapple canning, peeling, coring, slicing, filling cans, syruping, sealing of cans, sterilizing—is all done by machinery and the human hand does not touch the product. Even labelling tins, box-making, packing tins in boxes, nailing covers and delivering them for storage is all done by machinery. Another remarkable fact is that although pineapples are canned on such a large scale, yet the amount of waste material going out of these canneries is practically nothing. All the shells, peels, cores, trimmings, and other waste material collect automatically on one side and are utilized for making of juice or syrups, vinegar, alcohol, calcium citrate and fertilizer. Even the waste cans and tie wires used in stripping are utilized in the manufacture of iron sulphate, a solution used on the pineapple plant to supply it with iron.

Possibilities in India.—These figures are given only to illustrate how rapidly other countries are making progress in an industry that is hardly even known to the average man in India. The figures are no doubt astounding and may even serve to awaken our educationists and capitalists to the new possibilities in this industry. We have an abundance of some fruits at certain times of the year a large amount of which practically goes to waste. The surplus fruit if properly preserved or converted into several bye-products can fetch very good prices in seasons of scarcity. It will also enable the fruit growers to realize a good price for their fruits as they would not then have to dispose of their fruit at any price at the ripening season as they have to do now for fear of spoilage. The development in fruit farming largely depends upon the fruit preservation industry. Similarly vegetables like *peas* can be preserved in seasons of plenty when they can be had at a few pice a seer and utilized or disposed of in months of scarcity when they cannot be had except at exorbitant rates.

Preservation on Home Scale.—I need not, however, dwell very much upon the commercial aspect of this art as it will be a good

long time before we, well known for our conservatism, can expect to develop this industry to any commercial extent. For our purpose the method of food preservation on a home scale can be of immediate interest and in this respect at least we shall be well advised to follow the lead of the Americans. It is a hobby for the average American to utilize the back garden of his house for growing fruits and vegetables. This practice is encouraged by all public bodies and schools. The surplus fruit and vegetables from their plots that cannot be used fresh are canned in tins or bottled in glass jars or dried or converted into various by-products such as jams, jelly, syrup, vinegar or candy, etc., which are relished throughout the year. Most families possess a small equipment for this purpose costing a trifling amount of money. Then in other places or country towns where everybody has got a few kanals of land under fruits or vegetables they usually co-operate with one another and instal what is commonly called community canning or drying plant where everybody dries or cans his products in his turn somewhat in the same fashion as our villagers use the common well for irrigating their fields in turn.

As the subject of food preservation is to be dealt with in an entirely non-technical manner I do not purpose to enter into the scientific side of the question. But before starting the demonstration I may very briefly mention why foods spoil at all.

Why Foods Spoil.—Food spoils because of the growth and destructive action of minute organisms that are too small to be seen with the naked eye. They are present everywhere and are floating about in the air all the time. Whenever and wherever conditions become favourable for their growth these microscopic organisms begin to sprout, multiply and grow rapidly causing decay, decomposition, putrefaction, fermentation and souring of the food material. The various methods of food preservation are all based upon two main processes, viz., (a) either destroying these micro-organisms entirely, as in the case of sterilization, and preventing their re entry in the sterilized food, or (b) bringing about such conditions that, while not killing these organisms entirely, would definitely prevent their further growth and activity. These organisms belong to three main-groups, viz., Moulds Yeasts and Bacteria.

Moulds.—Mould (usuall known in Punjabi as “Ulli” لی) is commonly seen. It is abundantly found on bread, fruit, vegetables, pickles, etc., as white cottony growth. This cottony growth (called mycelium) later changes into green or blue colour and powdery in appearance. This change is due to the formation of billions of cells or spores which are easily detached and carried by wind to infect food in other places. These spores are killed at 180° F or 80°—85° C, i. e., even below the temperature of boiling water,

Yeasts.—Yeasts differ from moulds in that they do not form a cottony growth or mycelium. They are found in fermented liquids as a white sediment or a cloudy growth throughout the liquid. They usually grow in sugary liquids and convert the sugar into alcohol and CO_2 . They are usually used in making vinegar and alcohol. They are also very easily killed by heat at a temperature of 140°F or 60°C .

Bacteria, forming the third main group are the most difficult as well as most dangerous of all to deal with. Souring of milk or putrefaction of vegetables is due to the action of bacteria. They are smaller than yeast and differ in methods of reproduction, yeast reproducing by budding, bacteria by splitting or fission. They prefer nitrogenous substances of low acid content such as meat, milk peas, beans and other low acid vegetables. They do not grow on fruits or acid vegetables. As a contrast with his moulds and yeasts prefer sugary acid material. They are not all killed even at 100°C . The spores are very hard to kill for which reason even a temperature of 115°C (*i. e.*, under pressure) has to be used in several cases. While yeasts and moulds usually produce rather harmless products, bacteria in any food may produce very poisonous substances such as ptomaines. Of course some bacteria such as produce lactic acid for souring milk are beneficial also.

Temporary Prevention by Cold Storage.—Foods can be saved temporarily from spoiling by various methods such as cold storage, use of antiseptics, etc. Organisms need warm temperature for their growth. At freezing temperature their activities practically stop. This is the reason why fruit, vegetables, meat, milk, eggs, etc., can be kept without spoiling for a considerable period in cold storage (*i. e.*, room where the temperature is kept low).

Antiseptics.—Then there are certain antiseptics such as benzoic acid, sodium benzoate, formaldehyde, boric acid, sulphurous acid, salicylic acid, etc., which if added in a small quantity to food material will not allow organisms to grow. For instance, if any juice or other liquid food contains one per cent. of sodium benzoate it will not spoil. Sugar, salt, and vinegar are also used for preserving. Any solution of food containing 56 per cent. sugar in it will not spoil. This is the reason why jelly, jams, marmalade, honey, preserves or candied fruit can keep indefinitely. Similarly salt, if impregnated to an extent of 15 per cent. as in case of salted meat or vegetable, will prevent the food from spoiling. Vinegar as in pickles also preserves food.

Permanent Prevention by Heat.—Sterilization by heat, *i. e.*, destruction of organisms by heat is the surest and cheapest method that is most commonly used and forms the basis of the canning industry, a demonstration of which I am going to give this evening. Briefly it consists in packing the fruit or vegetable in tins or glass jars and filling the container with hot juice or salt solution; then sealing the tin or screwing the glass jars in

such a way that they become absolutely air tight and finally sterilizing the containers at different temperatures depending upon the kind of food on the container. If the container is thoroughly sealed so that air cannot enter at all and it is properly sterilized the product can be kept in good condition for an indefinite period of time.

Preservation of Pears and Peas.—Demonstration was then given in the canning of fruits and vegetables by taking pears and peas. The instructions may briefly be summarized as follows :—

1. *Preparation.*—Peel, core and halve the fruit. The peeled fruit during the time of preparation should be kept immersed in slightly saltish water to prevent the darkening of the fruit. Pea pods are shelled, washed and graded according to size.

2. *Sterilization of Containers.*—Sterilize the containers (i.e., tin cans or screw top glass jars with rubber rings by keeping them in boiling water for ten minutes. Also sterilize the caps of the cans and jars as well as the rubber rings.

3. *Packing.*—Pack the fruit or vegetable in containers.

4. *Syruping or Brining.*—Add boiling hot sugar juice to the fruit and brine or salt water to the vegetables until the containers are nearly full.

5. *Sealing.*—(Partial in case of glass jars). The containers (with boiling hot liquid in them) are at once sealed. A tin can can be sealed air tight by soldering or by a sealing machine that was shown in the demonstration. Glass jars with rubber rings can be capped by screwing down the cap. The rubber ring between the cap and the neck of the jar is necessary to make it air tight. The cap on the glass container is only fairly tightened at this stage.

6. *Sterilization.*—The containers are then sterilized by immersing them in boiling water. Fruit and acid vegetables are easily sterilized by keeping the containers immersed in boiling water for 15 to 30 minutes respectively. This is because moulds and yeasts grow in acid sugary products and are killed at 100°C , i.e., the temperature of boiling water. But in the case of non-acid vegetables like peas sterilization becomes difficult because all bacteria are not killed at 100°C . So either a slight amount of vinegar is added to acidify vegetables before the usual sterilization referred to above, or sterilization is necessary in a pressure cooker (about 5 to 10 lbs. pressure) for $\frac{1}{2}$ to 1 hour depending upon the kind or texture of product. The process of sterilization is the most important of all, and needs greatest care.

7. *Final Sealing and Cooling.*—Glass jars partially sealed (step 5) are now thoroughly sealed and made air tight. They are kept in the room in an inverted position to cool. Tin cans were already thoroughly sealed (step 5) before sterilization. After sterilization tin cans are put in cold water to cool.

Fruits and vegetables preserved in the above manner will keep for an indefinite period of time.

Similarly instructions for preserving other fruits and vegetables were given.

Fruit Products.—Demonstrations on bottling of fruit juices, making of jelly, jams, marmalade, preserves, candied fruits (i.e., vinegar, pickling,) etc., were given. For the sake of brevity the operations involved in candying fruit only are very briefly summed up as follows :—

Candying of Fruit :

1. *Puncturing, peeling and cutting.*—Small apples, apricots, plumps, figs may be used whole and punctured with a wooden tooth-pick in numerous places. Peaches and pears can be peeled and cut in half. The peel of citrous fruits to be used without pulp.

2. *Cooking until tender.*—The fruit is cooked gently until it is tender. Ordinary fruits require 3 to 5 minutes boiling only ; hard fruits may require little longer. Citrous peels may require about half an hour. Overcooking will spoil the shape and texture while undercooking will give a dark and poor product. The cooked fruit is then placed in an earthen jar.

3. *Placing in Syrup.*—Prepare syrup (1 part sugar to 3 parts water); heat the syrup to boiling and pour it over the cooked fruit in the earthen jar. Keep the fruit immersed for 24 hours. In preparing syrup half glucose may preferably be added.

4. *Increase of Sugar.*—After 24 hours remove the syrup and add to it $\frac{1}{2}$ the amount of sugar used the previous day. Heat it to boiling and pour over again on fruit. This process should be repeated every 24 hours, adding every day $\frac{1}{2}$ amount of sugar until the syrup reaches the consistency of honey after which it should be kept there for 3 or 4 days so that sugar may penetrate the fruit thoroughly.

5. *Drying.*—The fruit is then removed from the syrup and placed on a screen in the sun or in a warm room to dry until the fruit ceases to be sticky.

6. *Packing.*—The finished fruit is then packed in cardboard boxes or jars.

Note.—Importance of candying fruit can be judged from the large quantity of candied fruit that India imports every year. Mr. Peake at the time of the Agricultural Conference in Simla this year in August stated “no less than 64,000 tons of dried and candied fruit worth at least four crores of rupees is imported in India every year”. If the product were cheap, as it can be if manufactured in India, candying fruit can become a good industry.

During the discussion on marmalade Professor Lal Singh referred to the Malta-orange peel that is thrown away as well as to the khatta fruit that are allowed to go to waste by nursery-men after the extraction of seeds for sowing. Khatta fruit can also be had very cheap, and yet both of these things, i.e., waste peels of Malta oranges and peels and juice of khatta could be utilized by people at home for making marmalade and candied peels,

Drying of Fruits and Vegetables.—Demonstration was also given in the drying of fruits and vegetables which consisted in (1) Washing the fruits and vegetables. (2) Dipping in $\frac{1}{2}$ per cent. hot lye solution for 1 to 20 seconds. (3) Slicing. (4) Boiling for different lengths of time depending upon the kind of product. (5) Sulphuring the product in a small air-tight box. (6) Drying in the sun or dehydrating by means of artificial heat. (7) Sterilizing the finished product and packing it in insect proof containers. By dipping in lye solution the skin of the fruit is checked in numerous places which facilitates rapid drying. It also gives a glossy appearance to the product. Sulphuring is employed for various lengths of the time depending upon the kind of fruit or vegetable to bleach the colour and to make the product more attractive. The rate of drying is also increased. The product does not turn dark. In the case of several fruits and vegetables, however, some of the steps enumerated above are eliminated, being unnecessary or harmful. Details cannot be given in this publication and any one interested in the subject can correspond with the lecturer.

GRAPHS IN THE TEACHING OF MATHEMATICS IN SECONDARY SCHOOLS.

BY LALA HARICHAND, B. A., B. T.,

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The position that the teaching of graphs already occupies in the mathematical syllabus and how much is left to be desired in this respect may be summarised as follows :

Its introduction in the syllabus is welcomed, but its proper place and aim do not seem to be realised or at least do not seem to be attended to, because the fundamental idea of functionality or interdependence of two variables is much less emphasised than the graphical solution of equations. In reality it is the former that should always be kept in view by the teacher and the pupil should be led—very gradually—to realise it with increasing distinctness. Thus the proper treatment of graphs should look forward to calculus rather than to analytical geometry as its ultimate development. It must enable the pupil to think intelligently about related variables whether in simple cases such as the area and radius of a circle or in more complex instances as the height of the tide and the time of the day.

To be more clear about the mathematical treatment of functionality it will be proper to define Function at the outset. The modern definition of Function, as given in "Monographs on Modern Mathematics", edited by J. W. A. Young, is very wide.

"A single valued function of a variable x is a second variable y so related to x that whenever a value is assigned to x from the x -range, a corresponding value of y is uniquely determined in the y -range. The range of value need not be even numerical. If, for instance, we make a table showing the amount of annual rainfall in the different provinces of India, the table defines the rainfall as a function of the province."

But for beginners we ought to take only those functions which do exhibit some regularity (as charts of rainfall, temperature, weight and height of average people, etc.) and it is the study of these or of the particular pairs of relative variables that they represent which is important, at any rate, for beginners. For one aspect of functionality is law of connection. The concept of the world as a cosmos, an ordered whole governed by laws, is an outcome of education and towards this, mathematics, in terms of which some of these laws may be expressed, has essential contributions to make. The sense of order in the facts of nature is one of the great results to be won from the use of graphs. When acquired it carries with it the recognition that intermediate results may be obtained with more or less accuracy and certainty from the graphs, *i. e.*, we can interpolate or predict.

The realisation of orderliness in a graph is quite different from expressing that orderliness by a mathematical formula and the latter need not be attempted in the school. Graphical interpretation of a phenomenon has preference over other ways of expressing the same for the following reasons :

(I) Take the graphs of statistics.—

(a) The primary use of a graph is to exhibit to the eye a series of simultaneous values of two quantities. Thus if we know the temperature at each hour of the day we can in some respects seize the facts more readily from a plotted than from a merely tabular record. The full significance of complete tabulated records cannot be appreciated on account of the mass of figures involved and their not being shown in a continued form.

(b) Further the continued record of graph at once brings home to the mind and forces upon the attention the manner of change. This can be done from the table also but only with difficulty.

(c) Again if we plot the amount of a sum of money at a fixed rate per cent., first at simple interest, then at compound, any one will appreciate the statement :—“ In one case the amount increases uniformly, in the other more and more rapidly as the time goes on”. In all such cases the pupils will have little or no difficulty in connecting greater or less rate of change with greater or less steepness of the curve. But no attempt should be made to specify the rate numerically. Rough terms like, ‘decreases slowly’ or ‘increases rapidly’ have a legitimate or even necessary place, at all events for beginners ; because the very habit of using such terms will itself develop the sense of the need for an exact measure of rate of growth at a later stage.

(d) The importance of getting into the habit of translating from graph into language and from language to graph cannot be too much emphasised. The former gives simple and precise exercises in the accurate statement of matters which are clearly apprehended and the latter develops a new power of seizing the inner meanings of complex numerical statements. In short, in this practice there is a most valuable opportunity for developing mathematical insight.

Concrete phenomena of all kinds give useful occasion for such exercises. Some may arise in the laboratory, some in the geography room while others may be introduced in a mathematical lesson. Among the more interesting of the last mentioned are the weight or height and the age of the average human being.

Thanks to the recent development in practical psychology we are now in a position to compare the graphs showing the original intelligence and the university results of different examinations of the same set of candidates. The graphs when compared throw much light on the suitability or otherwise of the curriculum and indicate in unmistakable terms how far the university results may be taken as tests of intelligence. This, all that is most fundamental in the meaning and interpretation of graphs can be taught in connection with graphs of statistics or results of observation. But here as everywhere else care should be taken to keep to cases which lie within the natural interest and knowledge of pupils. It will not be out of place if occasionally the teacher begins to discuss the possible causes lying behind the phenomena expressed by the graph. Although such discussion is not mathematics it makes the class feel that mathematics has an actual bearing on life and other subjects.

(e) Incidentally, in the mere mechanical work of making graphs of statistics, boys get some very valuable arithmetical training. Their sense of the relative values of numbers (including decimals and fractions) is greatly strengthened.

(II) Let us take the functions expressed by formulae. A few more considerations present themselves when we pass from the function defined merely by tables to functions expressed by exact laws of mathematical formulae.

A beginning should be made with arithmetical and geometrical examples where the formulae, though possible, is not known to the students; *e. g.*, it is 180 miles from Ambala to Lahore, draw a graph showing the average speed of trains making the journey in 3, 4, 5, etc., hours. This particular example gives an excellent introduction to the idea of "infinitely small or large," provided the statement is made as "speed can be made as great as we please by making the time small enough and the like!"

Among geometrical examples boys may be told to plot the lengths of chords of a given circle subtending various angles at the centre and the like.

In the domain of statistics the boys are accustomed to do isolated sums, each dealing with a different set of quantities as speed and time, quantity and price, etc., and so the ideas expressed in the terms variable, independent and dependent are natural even for beginners, but when they use the formulae a difficulty arises. They use the formula only as a means of working out separately any particular case wanted, instead of as it were a living thing showing the relation between two constantly varying quantities. There is in fact a wide gap between the knowledge that the area of a circle can be calculated from the formula πr^2 and appreciation of this fact in the form "the area grows as the square of the radius."

It is just this sense of relationship and co-ordinate growth according to various laws that is so important and that ought to be developed through graphs.

There is another point.

Different concrete cases lead to formulae which are essentially the same and so have the same graph.

As cost—price—quantity ;

distance—speed—time ;

interest—rate—time ; and so on. Hence the conscious recognition that these different cases are expressed by the same graph is a distinct step in the development of the sense of functionality.

Another consideration that needs to be borne in mind while drawing graphs from formulae is as in graphs of statistics of facts of nature that the boys should meet with only such functions that give an orderly set of results when developed arithmetically. The effective realisation of this fundamental fact is the result of mathematical experience only. This connotes the power of self-criticism and confidence both in one's own work and in the reasonableness and coherence of the subject. The twofold aspect of this lesson is important and can be fully grasped if the students are left to themselves to correct their mistakes in evaluation and plotting which generally happen in the beginning.

This power of drawing a graph from a formulae helps a good deal when the students have to study the functions x , x^2 , x^3 , $\frac{1}{x}$, $\frac{1}{x^2}$ and \sqrt{x} . Hence the detailed suggestions for practice may be summarised as follows :—

(1) The drawing graphs should be taught in connection with statistics like temperature and rainfall charts which are prepared by the students themselves or arithmetical and geometrical examples as given above. One point with respect to the graphs of statistics should be borne in mind. It is that in these graphs interpolation is impossible from the very nature of the case.

Hence the points of graphs should be left in isolation and if they are joined by straight lines they should be distinguished by small circles drawn round them. If however the order of points suggests some curve which can be drawn free hand we may get some indication of the probable results of intermediate observation, but it does involve more or less serious element of guess-work.

(2) It is better to work at first with the horizontal axis only for the independent variable and the ordinate for the dependent variable being measured upwards from the point on the axis to which it corresponds.

(3) If this preliminary work has been done properly its extension to algebraic examples is simple. We should plot a set of values like x^2 , $(x+2) + (x+4)$, x^3 , $\frac{1}{x}$.

Thus the mere plotting of isolated points for exercises in the mechanism of plotting and examples of finding distances between two points or the area of triangles formed by three points are irrelevant.

(4) One difficulty arises in the case of Multiplication by negative numbers and so it should be remembered that the rules of signs in multiplication are to be justified in experience and are not laws which can be proved. Suppose we are graphing $(x-2)$ $(x-4)$ and we have plotted the points for x greater than 4 and we then have to consider cases when $x=4$, $x=3$ and $x=0$. In such cases the rules may be stated dogmatically and their justification is that the points obtained harmonise with the rest of the curve.

(5) The essential thing so far is that the pupils should learn by experience that if the work is done correctly the result will be an orderly curve. Hence the simpler the arithmetical work involved the better and the pupils should be trained to answer such questions. What value or values of x make the expression for which we have drawn the graph equal to some assigned value, that is the solutions of the question $f(x)=a$. Similarly for what value of x is $f(x)>a$ or $<b$? Can it have any value we may name and if so how many values of x give it the specified value? For what value of x is it the greatest, etc.?

All that is now necessary has been taught or rather will have been learnt by experience. Now the teachers' business is to utilise the method and associated ideas, whenever it is advantageous; for example much light can be thrown on the meaning of equations and if the students are enabled to solve approximately equations of higher degree they will have a sense of increased power and increased insight. They are of great value in discussing the various cases of the roots of quadratics which I believe will be included in the M.S.L.C. course in the near future. On the other hand the use of graph for the solution of equations and problems that can be more easily dealt with by ordinary methods is to be deprecated. I may be justified to illustrate graphically the meaning of the solution of two simple simultaneous equations and the fact that it is unique, and a case or two may be given for actual graphic solution but this should not be treated as an end in itself nor should many exercises be given to develop skill. From this point of view it is quite clear that the present style of paper (A) on Mathematics in the M.S.L.C. Examination needs a good deal of reform. Every year the question on Graphs demands the solution of two simple simultaneous equations. This is objectionable.

Similarly sets of examples in the chapter on graphs in "Algebra for Beginners" by K. P. Basu and others are irrelevant.

These suggestions are submitted with the hope that if they are taken for what they are worth, they may serve a useful purpose

LIBRARIES FOR CHILDREN.

BY MRS. A. E. HARPER, M.A.

A critic of education claims that the schools teach children *how to read*, but do not teach them *to read*. The criticism is only too well merited by the majority of schools. Children may learn the mechanics of reading, more or less effectively, by the time they have finished the Upper Primary standard, but how few

of them have learned to read with enjoyment or have formed the habit of reading in leisure hours. Still fewer have learned to read rapidly and accurately for the purpose of securing needed information. How few continue to enrich their lives and to grow through reading after leaving school ! How many who leave the school after the Primary relapse into practical illiteracy.

It is not uncommon to hear the opinion expressed that the curriculum of the Primary School should not be widened to include the so-called frills of education, but should concentrate on "the three Rs." It has been my observation, however, that the very teachers who are most insistent that the three Rs. should be emphasised, often teach the three Rs. most inefficiently. If the Primary School is to teach only reading, writing and arithmetic, surely we have a right to demand that these subjects be taught successfully. As most time and attention in the early years is given to reading, the teaching of that subject should be judged by the most rigid tests. If the pupils have *not* learned to read simple material rapidly accurately and with enjoyment, and if they have not gained a habit of reading for purposes of information and recreation, the school has failed.

The Middle School also has no more important task than to improve the scholars' speed of reading, their comprehension of what is read and their enjoyment of reading. Their progress in the other subjects of the curriculum depends very largely upon their ability to read well. This point has been proved by several investigations recently carried out with large numbers of school children in America. It was found that the pupils who stood low in reading speed and comprehension were also low in other school subjects. Many pupils who fail in geography and history in the High School, fail *because they cannot read*.

A useful instrument in teaching children *to read* is the library in the school. So important is this aid, that I am willing to say it is almost impossible to teach reading effectively without class libraries in each room. Class libraries are far more important than the text-book in reading. From the text-book children learn *how to read* ; with the aid of the library, children learn *to read*.

Three questions may well be asked : Why are class libraries desirable ? How should class libraries be used ? And how should class libraries be selected ? In order to answer these three questions, we must pause to observe the best modern practices in teaching children to read, and inquire into the scientific reasons underlying them.

In schools where methods of teaching reading are based on reliable scientific investigations of how children learn most efficiently, a *large amount of reading material* is provided even in the first year. Instead of learning by rote one Primer, the children

learn (by efficient instead of haphazard methods) to read so rapidly and with such enjoyment that they complete many books, both Primers and First Readers, in the first year. I have myself seen several First Grade class rooms where 20 to 30 different story books were provided for voluntary reading and where the slowest children read at least 5 of these books, and the average children 10 or 12. You will say this is impossible, and indeed it would be impossible where the ordinary dulling, unscientific, wasteful methods of teaching reading employed. But by using methods based upon scientific knowledge of the laws of the mind, these results are possible and have been many times attained.

The methods cannot be described in details within the limits of this paper, but a brief outline of the essential features of the teaching procedure can be given.

1. From the very beginning the reading lessons consist of material which has meaning to the child.

2. This material in the early weeks is taught from the blackboard. The children do not have books for several weeks. Thus the teacher writes on the blackboard a very short "story" from the children's daily experiences.

3. The general procedure is from a reading of the whole story to a study of individual lines and phrases, and then to drill on individual words which are learned by sight.

4. The skill acquired in from five to eight weeks of such reading enables the children to begin the reading of simple primer material with fluency and comparative ease.

5. The supplementary readers contain stories interesting to children, each story being very brief and containing a large proportion of repeated sentences, phrases and words, so that progress is made rapidly.

6. After this work is well started, training in the independent phonetic analysis of new or unfamiliar words is given.

The above represents a fair sample of the procedure in teaching beginners to read, followed in many public schools in America. It is not possible in the Punjab to follow this procedure fully in teaching Urdu, because there is such a dearth of suitable readers. Still much can be done by making use of all the material available.

In the school with which I am most familiar, the Moga Training School for Village Teachers, these methods have been used with remarkable success. The boys in the First Class learn to read very rapidly, and about half of them are usually promoted to the Third Class at the end of one year. The teacher begins by writing on the blackboard stories closely related to the boys' lives and interests. They learn first the whole story, then parts, then learn to distinguish phrases, and finally learn to recognize words by sight. Later they are taught the phonetic elements

of words and learn to master new words. After from one to two months of this kind of reading the boys read the Beacon Primer or some other Primer, and later read other readers. The teacher selects from several books and magazines in the class library, stories and other material interesting to the boys, and perhaps related to some activity or project they are engaged in. Three story papers are subscribed to by the school for this class—two are weeklies, 'Phul' and 'Nau Nihal', and one a monthly 'Khazina-i-Jawahar.' The coming of these magazines is eagerly awaited by the pupils. The interest in them greatly stimulates the reading.

This interest and progress in reading could never be attained without the class library of supplementary readers and magazines. You can see that our ideal at Moga is to teach children *to read*, not merely *how* to read. Children learn to read by reading material that has meaning and interest to them, not by mumbling over and over meaningless syllables and letters.

You can see how contrary to the best educational practice was the criticism of an inspectress who found a class reading the newspaper in their reading period. She said, "One reading text-book is prescribed for this class. It should be read over and over and thoroughly learned." It is such unintelligent teaching as this that produces readers who never read after they leave school.

Class libraries are even more essential in the higher grades. In the Second Year and later, children should read much more than the prescribed Second, Third, Fourth and Fifth Readers. Several sets of readers should be on the shelves of the class libraries, many story books not too difficult for children to read with enjoyment, and also some more difficult books for reference. Books on elementary science, or geography and history, may be too difficult for the pupils to read through. But if they are trained to go to such books to find out the answers to questions they are asking, they will be able with help to read the necessary page or two. From the Fourth Year on, pupils should be taught to use an index, to skim over paragraphs in order to find the information they want, in short, to use reference books. This kind of reading is most useful in life.

Most of the reading done in school is done orally. A pupil reads aloud and each other pupil in the class must follow at the same rate of reading, in order to keep the place and be able to take his turn. This kind of reading is probably necessary at first, but it should be decreased in all the grades above the first. In the Second Year, half of the reading the pupils do in school should be *individual silent reading*. In the Third Year and above, more and more of the reading should be silent reading.

What are the reasons for this emphasis on silent reading? First of all, most of the reading done in every-day life is silent

reading. If the school teaches the child always to read orally, it is failing in its task of preparing the child for life. Have you ever seen a person who has finished school, reading the newspaper, and moving his lips and even mumbling the words as he reads? Would you say that such a person has learned to read rapidly and with delight? Lip moving and mumbling are the direct results of the *method* used by the school in teaching beginners to read. Too much oral reading and lack of practice in silent reading are responsible for this fault. Every lip-mover and mumblor is a sign of the failure of the Primary School to teach reading.

The second reason for emphasizing the teaching of silent reading is that every pupil should be able to attain greater speed in reading silently than in reading vocally. The eye can move more rapidly than the lips and tongue. When the child reaches the point where he can read more rapidly than he can vocalize, the teacher is doing him a positive injury by continuing to require him to read orally. The person trained to read orally only is often a very slow reader. Many a scholar fails in examination because he is slow to read and comprehend the questions. It is the duty of the school to teach rapid reading. Every teacher should give simple tests, timing their pupils in silent reading, to determine their speed. The following are the approximate standards of speed for each class. The material read should be that in the reader for that class, or about equal to it in difficulty:—

Class II	should be able to read	100—140 words per minute			
Class III	„ „ „	120—160	„	„	„
Class IV	„ „ „	140—180	„	„	„
Class V	„ „ „	160—200	„	„	„
Class VI	„ „ „	180—220	„	„	„
Class VII	„ „ „	190—230	„	„	„
Class VIII	„ „ „	200—240	„	„	„

These are the standards worked out by testing tens of thousands of pupils reading English. No standards have been established for reading Urdu.

The third reason is that by teaching silent reading scholars are better trained to use books effectively. Oral reading in Indian schools is so often a parrot-like performance. Silent reading may be used to train pupils to search for information in books, to read for enjoyment, to skim over unimportant parts, and to read other parts very carefully. Silent reading in the Primary classes is excellent preparation for learning how to study in the Middle classes.

If pupils are taught silent reading in the Primary classes, they will be able to use the class libraries of the Middle classes.

much more intelligently. Boys or girls of this age will take pleasure in selecting part of their own library. Several valuable exercises and games are suggested in "One Hundred Ways of Teaching Silent Reading." by Smith.* In selecting the library, let each scholar read one book (during reading lesson period or as supplementary reading outside of school) and report on it according to the following form :

Title of book or story.
 Name of author.
 Did you like it ? Why ?
 Tell something about it.

Another good project is making story-books for some younger class. I heard the other day of a class that undertook such a project. This class had begun the study of English. They chose a simple English story, translated it into their vernacular, wrote and illustrated it beautifully, bound it into a book, and gave it as their gift to a younger class who did not understand English.

Story-books may be made by cutting up old readers, illustrating the stories, and binding them separately.

The Middle classes should arrange their own libraries, and make card catalogues of them. They may also learn to make index of the stories and the information found in various books.

A very good way of stimulating interest in new books is to allow each of the several scholars to read the first chapter in a different book. Then have a speaking contest in which each tries to make *his* book most interesting to the others. Let the other children vote which book they want to read, as a result of the speeches.

The above suggestions on how reading should be taught may help to answer the three questions with which we started :— Why are class libraries desirable ? How should they be used ? and how should they be selected ? I should like to close by speaking of some of the facts in psychology on which these suggestions are based.

These methods of teaching reading are not fads. They have a scientific foundation. Much painstaking investigation has been made of the psychology of learning. Certain clear laws have been established. The conditions under which learning best takes place are known. Teachers should know these conditions and fulfil them so far as possible.

It is impossible here even to outline these conditions of success in teaching, but one law and its application in teaching reading and the use of class libraries may be treated. This law is

*Published by the Word Book Company, Yonkers, New York.

that children *learn best what they practise with success and satisfaction*. If we wish them to learn reading quickly we must provide conditions in which they practise reading with success and satisfaction. The condition is not met when we begin the teaching of reading by making children memorise meaningless letters and symbols. The method which from the very beginning presents meaningful, interesting material to the children is more successful in teaching them to read quickly. This beginning method needs to be supplemented later by the provisions of "plenty of interesting material." You can see how a shelf of story books and two or three children's magazines in the First Year class room will add to the interest the children will have in learning to read. This is not sugar-coating learning for children, it is merely taking advantage, in a common sense way of a *known* law. We learn what we practise *with success and satisfaction*.

Notice also that "we learn *what* we practise with success and satisfaction." In other words, children must practise the *very* thing we wish them to learn. Let us see if we usually teach them to do that. We want our pupils in the Middle classes to acquire the ability and the habit of reading intelligently and with pleasure all kinds of printed matter. Do we actually give them practice in *this very thing*? We give them plenty of practice in reading aloud one paragraph in a stilted, formal fashion. But that is *not* what we wish to teach them. If we wish to secure ability to read consecutively and silently a long article, a story, or even a whole book, we must give opportunity in school to do that very thing. And if we are to give that opportunity, libraries are essential. If we wish the pupils to gain a habit of using leisure time in reading that will enrich their lives, we must see to it that they enjoy reading in school. For this, libraries are essential. If we wish boys and girls to be able, after school, to secure information from books and comprehend it rapidly, they must have in school plenty of practice in looking up information in a great variety of books, and plenty of practice in rapid silent reading. For this libraries are essential.

The proper use of class libraries for every room will do more to improve the teaching of reading, than any other single factor. Such a library may be a matter of pride to the class, and will help to teach them to love books and care for them, as well as to use them.

EPIDEMIC DISEASES AND OUR MICROSCOPIC FOES.

By DR. S. N. ROZDON,

Health Officer, Amritsar.

The subject of Epidemics is daily becoming of vital importance to the public and it is the duty of all those who have good of the people at heart to do their level best to enlighten public opinion on it. The Intelligensia of the country has shown a little inclination to grapple with this serious problem and it is the expression of their feelings which has impelled me, a humble sanitarian, to stand before the experienced educationalists of the Province and deliver a short address.

Epidemic diseases are nearly all of them preventible although our medical knowledge has not reached such a perfection as to enable us to say that we can prevent the spread of all contagious diseases ; but we have advanced in our knowledge of a majority of infections to such a degree that ordinary infections with which our towns and country places are often invaded can certainly be prevented if the masses co-operate with the department of public health. Before asking for co-operation two things are necessary for the public, (1) to obtain knowledge of the diseases, (2) to know the methods of their prevention.

Epidemic diseases, as I am sure all of you are aware, are diseases which are caused by some micro organisms invisible to the naked eye and spread through air, water, milk, dust, fleas, mosquitoes, flies, bugs, etc. Take, for instance, the case of Small-pox, Cholera, Plague, Tuberculosis. Each of them is a preventible disease. In every civilized country efforts are being made to reduce the mortality from these and other allied infections. How is it done ? By active propaganda and co-operation of the public. Awakening of public opinion by constant diffusion of knowledge about matters pertaining to health and hygiene amongst the masses, by means of cinema shows, by forming health societies, by repeated discourses on hygiene and sanitation to boys' and girls' schools, are matters for your deep consideration.

Much of our apathy towards Home Hygiene, Maternity, Child Welfare and common communicable diseases, are due to want of education amongst the women folk. Is it not a most shameful custom amongst some classes of Indians to allow no proper education to their girls ? Is it not cruel for another set of Indian parents to marry their daughters at an age where they should be playing with dolls in the sweet surroundings of their happy homes. Gentlemen, how long will this continue ? How many of us assembled here can put our hands on our hearts and say that our relations, their kith and kin have not yielded to these objectionable customs of society ? As long as education of the right sort is not given by parents to their children our

conditions will remain hopeless. Hygiene and sanitation are not articles sold in the bazar, but they can however be purchased at a cost which although high is yet within the reach of every one. Thanks to the Education Department of the Punjab, Hygiene is a subject which is taught in the schools now, both boys' and girls'. I submit that it should be made compulsory. We should not stop there only, we should see that Hygiene is practised in our homes, that our children have truly digested the principles of Hygiene. They should not aspire to become only M.A.'s and B. A.'s, F. A.'s, and Matrics, in Hygiene or other subjects. We want practical Hygienist, men and women who act up to their beliefs, men and women who consider it their duty to impart knowledge to others in their own humble ways. After all, what good is it if I am an educationalist or a moralist or a hygienist, if I do not practise the tenets of my own religion? Is it not a common sight for one to see in an Indian Bazar, young students coming from schools or going to them, eating a pice worth of sugarcane and throwing wildly the chewed up waste to their right and left much to the disgust and disappointment of sane persons? Such students may have had lessons in Hygiene but they, poor beings, only learnt the subject to pass their examination. Gentlemen, when shall all this end? Are we to remain backward in our sanitary habits while other countries are so advanced? Surely we must go ahead. Unfortunately a vast majority of us talk a lot and do very little. We follow Western habits in our dress but lack in our physique, and hygiene of the West. India had a splendid past, we are all proud of it, let us therefore construct an edifice on the ashes of old India, worthy of the name. Our country is not bankrupt of sincere workers, true leaders and ardent followers in social reform and uplift.

There are not many Indian homes which have escaped the depredation of one communicable disease or another. Millions have died of Cholera, Small-pox, Tuberculosis and our present day foe, the Plague. Every year these diseases take a heavy toll of human lives in one Province or another. Annually we are reminded of our abject and miserable plight in the face of an epidemic. A virulent epidemic claiming hundreds of victims comes and subsides. Popular alarm and fear are allayed while the subsidence affords no little relief to the over-worked, over-criticized but heavily understaffed Health Department of the unfortunate town. Controversies die away, reports, statistics and all other materials collected on the subject are forgotten or lie in dusty pigeon holes till some other day the tocsin of alarm is rung again to awaken the public to realise the gravity of the coming situation and to bestir themselves to take all effectual measures to check the disease and its holocaust. But apathy, listlessness, callousness towards common weal and public welfare, fanaticism, adherence to dogmas which have been found unworkable and impracticable in other civilized countries have taken such deep roots in our society and are eating into its vitals so

remorselessly that any further delay in taking up the work of reformation will react banefully on the health of the nation. It is not only the microscopic foes that we have to fight out but our macroscopic foes also—I mean the vast majority of the masses who are under the sway of one selfish religious preacher or another. Let me not allow you to be carried away with the idea that I am in any way attacking the religious reformers, the great spiritual leaders, the truthful and pious sages of the different communities. Far be it from me. But I am most certainly attacking every person who teaches abhorrence towards advanced ideas of public health and sanitation, every spiritual Guru who thinks that to act against the exhortation of a particular book made centuries ago is blasphemy and the actors thereof are heretics, every religious authority who considers and actually preaches the idea that every visitation of an epidemic is an outburst of the wrath of God and his deities and must therefore be submitted to silently without moving our little finger even to prevent its occurrence or control its progress. There is no dearth of the people of the type described above. They are our macroscopic foes. We must therefore equip ourselves to fight against great odds and therefore we must produce sanitary giants to win our battle. They should be many tongued and many eyed and many in number. The type of macroscopic foes described above will certainly wish, for their own selfish motives, that their disciples should on no account learn new things and join the new party, as their livelihood depends on the masses ignorantly clinging to old, rejected and abandoned views. We have to fight a double battle, the macroscopic foes on the one hand and the microscopic foes on the other. The task is stupendous ; for the good of the country and the nation it must be fought out. Our cause is right and just, we must rise and act.

The world at present as compared with the world of our great forefathers is a different institution. Improved means of communication have brought different people of different colours, castes and prejudices close together. In early days the diseases travelled by caravan, now they travel by steam ships, by rail roads and by automobiles, and will possibly in the near future travel by aeroplanes. Studies of epidemics in the past and present time give abundant confirmation of this accelerated spread of infection and diseases. These means of speedy transport of men and disease under the present conditions compel us to follow the Western standard and ideals of public health and their method of fighting every communicable disease in so far as such practices have led to beneficial results. Gentlemen, when our bacterial bonds with the Western countries are getting closer and closer, our methods of fighting the bacteria which by the experience of thousands of self-sacrificing gentlemen have proved of startling value, must also coincide. The Government is behind the public with its Public Health Department to assist and guide.

It is the duty of the Public Health Department and its officers to educate the people in all up-to-date knowledge of communicable diseases and their prevention. I can assure you that the Department concerned will never fail in its efforts. We are already doing lot of educational work in this direction. Each officer of the Department is imbued with the sincere wish to serve the public for whose sole benefit it is created. It is sorely in need of co-operation of the people for their own welfare. These two beneficial departments working hand in hand can put up a fight—an honourable and noble fight—against the odds which are heavy indeed as stated by me previously.

If I may venture to put up a rough sketch of the plan for your consideration I would at once suggest the formation of a Scout Association for each school in the Province and imparting to each Scout an elementary knowledge about the infectious diseases which visit our Province now and then and their prophylaxis. They should be pledged to repeat what they learn to others. Each Scout should be looked upon as a potential sanitary soldier. To train him and transform him into an active sanitary propagandist is the duty of each member of the Health and Education Department.

Action is better than precept and unless scout masters, school masters and head masters are eager to assimilate the subjects of sanitary importance, they cannot in their turn be expected to exert healthy influence on their wards. Much time is lost in talking, let us act now.

Let each of us sitting here make up his mind to keep the torch of learning alight and carry it to every nook and corner from north to south, east to west, far into each hamlet of our country to clear away the darkness due to ignorance and blind faith and thus save a nation the members of which are dying in thousands from insanitation, ill-health and preventible diseases. May God give us strength to reach our goal.

The Clock of Life is wound but once
And no man has the power,
To tell just when the hands will stop
At late or early hour.

Now is the only time you own ;
Live, Love, Toil, with a will,
Place no faith in " To-morrow " for
The Clock may then be still;

EYE TROUBLE AMONG SCHOOL CHILDREN.

BY DR. SOHAN SINGH, M.B., B. S.

The chief eye complaints amongst school children are weak sight, sore eyes and squint. The last is not common but is very disfiguring.

The common causes of weak sight are errors of refraction and opacity of the cornea. In the former case the eyes appear normal but sight is not clear, or they get easily tired. Myopia and hypermetropia are the two chief kinds of errors of refraction. In myopia even very small letters can be read clearly provided the book is held close to the eyes, but things at some distance cannot be seen distinctly so that the child in many cases is unable to read what the teacher writes on the black board or point out on a chart or map hung against the wall in the class rooms. Except in rare cases the disease is caused in early school-going age by prolonged application of the eyes to near work, particularly if such work is fine—for example, reading books printed in very small type—or if light is bad. Weakly children and those who stoop over their work are more liable to get it. Consequently it can be avoided by attention to the following :—

1. By teaching only such books which are printed in decent sized type.
2. By holding classes either in the open air—wherever and whenever possible—or in such rooms which are big and have got many large windows with glazed shutters to admit plenty of light.
3. By allowing short intervals of from 15 to 30 minutes for outdoor play or drill after every two hours of book work.
4. By not giving any home task at least to children reading in the Primary or Lower Middle Classes.
5. By advising parents that children's diet must contain nourishing articles of food such as milk, butter, sugar, and fresh fruit in addition to the usual bread, etc.
6. By seeing that children sit erect while reading and writing.

Early detection of myopia and correcting it with suitable glasses is essential for preventing the progress of the disease and for this purpose regular annual inspection of eyes of all school-going children is necessary.

In high degrees of hypermetropia neither distant nor near objects appear clear, moreover the eyes are liable to remain sore, but when this defect is slight the sight is usually good and the chief complaint is that eyes get easily tired with reading or writing. In some children the chief complaint is headache which comes on during the later portion of the school-hours every day. Hypermetropia unlike myopia exists from birth and is non-progressing though more troublesome and its remedy lies in the use of suitable glasses.

Weak sight which is due to opacity in the cornea is usually incurable and if a child has got this condition in both eyes he is very often not fit for study.

The chief cause of sore eyes in our country among school children and even in others is the very serious disease which is popularly known as Granular Lids. This is a very chronic and contagious disease. Want of personal cleanliness and possibly of good food are the chief causes, and consequently it occurs very extensively amongst the poor people. It is communicated from one individual to the other by the sticky discharge (gid) from the diseased eye being transferred to a healthy one by :—

- (a) Using a common towel or handkerchief or other cloth for wiping the face and eyes by more than one individual ;
- (b) By sleeping in common bed clothes ;
- (c) By touching eyes with soiled fingers ;
- (d) Possibly through infected dust.

The seriousness of this disease lies in the serious damage which it ultimately does to the eye-sight. In untreated cases it very often leads to blindness. In all cases it is a source of prolonged discomfort incapacitating the individual for study and many other vocations of life.

Its prevention lies in educating children in the mode of its spreading as given above and reminding them of those facts over and over again. Regular medical inspection of eyes is very important here. Children detected to be suffering from this disease should be put under proper medical treatment which should be continued until they are certified to be cured. During the period in which a child is having sticky discharge (gid) from his eyes, he should not be allowed to attend his class or to live among other children in a boarding house.

One thing must be clearly understood, namely, that the acute discomfort caused by this disease is not continuous. There are intervals during which it is subdued and the eyes look better. Such intervals are followed over and over again by periods of

acute trouble. This would not occur if treatment is continued until such time as a total cure is pronounced by a competent authority and for this purpose application of medicine for several years is usually necessary.

Squint is the disease in which the individual suffering from it is unable to direct both the eyes simultaneously towards the object looked at. It is not very common and appears usually in early childhood, even in infancy. The following facts should be widely known about it :—

1. That in majority of children it is caused by hypermetropia and that when it is thus caused it can be cured by constant use of proper glasses. The spectacles should be worn as soon as the defect is noticed, even if the child be very young.
 2. That squinters use only one eye and consequently the other or the squinting eye is very apt to become very weak from want of use.
 3. That if proper advice is not sought and acted upon very early the squinting eye will very probably become useless permanently.
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SCIENCE OF BREATHING.

BY CAPTAIN J. N. LUTHRA, I. M. S.

You will agree with me when I say ‘ Breath is Life,’ or Life is absolutely dependent upon the act of breathing. To breathe is to live, and without breath there is no life. It is not only essential for the higher animals but lower animals and even plants have to breathe to live.

The newly born infant draws in along deep breath, retains for a moment to extract from it its life-giving properties and then exhales it in a long wail, and lo ! its life upon earth has begun. The old man gives a faint gasp, ceases to breathe, and life is over. From the first breath of the infant to the last gasp of the dying man it is one long story of continued breathing. Life is but a series of breaths.

Breathing may be considered the most important of all of the functions of the body, for, indeed all the other functions depend upon it. Man may exist some time without eating ; a

shorter time without drinking ; but without breathing his existence may be measured by a few minutes.

Man is not only dependent upon the breath for life, but he is largely dependent upon correct habits of breathing for continued vitality and freedom from diseases. An intelligent control of our breathing power will lengthen our days upon earth by giving us increased vitality and powers of resistance, and on the other hand, unintelligent and careless breathing will tend to shorten our days, by decreasing our vitality and by laying us open to disease.

In these days men and women have forgotten the correct methods of breathing. Only the new born babe and primitive man know how to breathe properly.

In these days due to certain customs and habits civilised man has forgotten how to breath properly, hence requires instructions.

The percentage of civilised men who breathe correctly is quite small, and the result is shown in contracted chests and stooping shoulders, and the terrible increase in diseases of the respiratory organs, including consumption "the white scourge." Eminent authorities have stated that one generation of correct breathers would regenerate the race, and diseases would be so rare as to be looked upon as a curiosity. Whether looked at from the standpoint of the oriental or occidental, the connection between correct breathing and health is readily seen and explained.

The occidental teachings show that the physical health depends very materially upon correct breathing. The oriental teachers not only admit that their occidental brothers are right, but say that in addition to the physical benefit derived from correct habits of breathing, man's mental power, happiness, self-control, clear-sightedness, morals and even his spiritual growth may be increased by an understanding of the 'Science of Breathing.' Whole schools of Oriental philosophy have been founded upon this science and this knowledge when grasped by the Western races, and by them put to the practical use, which is their strong point, will work wonders among them. The theory of the East added to the practice of the West, will produce worthy offspring. Breathing exercises are taught now in schools to children but with some defect. They are not taught the correct position of the chest at the time of inspiration.

The organs of respiration consist of a pair of lungs on each side of the chest and the air passages leading to them. The lungs are separated from each other by the heart, the big blood vessel, and the larger air tubes. Each lung is free in all directions, except at the root, which consists chiefly of the bronchi, arteries and veins connecting the lungs with trachea and heart. The

lungs are spongy and their tissues are very elastic. They are covered with a delicately constructed but strong sac, known as the pleural sac, one wall of which closely adheres to the lung, and other to the inner wall of the chest, and which secretes a fluid which allows the inner surfaces of the walls to glide easily upon each other in the act of breathing.

The air passages consist of the interior of the nose, pharynx, larynx, windpipe or trachea, and the bronchial tubes. When we breathe, we draw in the air through the nose, in which it is warmed by contact with the mucous membrane, which is richly supplied with blood ; after it has passed through the pharynx and larynx it passes into the trachea or windpipe, which subdivides into numerous tubes called the bronchial tubes, which in turn subdivide into and terminate in minute sub-divisions in all the small air spaces or cells in the lungs, of which the lungs contain millions. A writer has stated that if the air cells of the lungs were spread out over an unbroken surface, they would cover an area of fourteen thousand square feet.

The air is drawn into the lungs by the action of the diaphragm, a great strong dome-shaped sheet-like muscle, stretched across the chest, separating the chest box from the abdomen. The diaphragm's action is almost as automatic as that of the heart, although it may be transformed into a semi-voluntary muscle by an effort of the will. When it expands, it increases the size of the chest and lungs, and the air rushes into the vacuum thus created. When it relaxes, the chest and lungs contract and the air is expelled from the lungs.

Respiration consists of the alternate expansion and contraction of the thorax, by means of which air is drawn into or expelled from the lungs. These acts are called Inspiration and Expiration respectively.

For the inspiration of the air into the lungs a movement of the side walls and floor of the chest takes place, so that the capacity of the interior is enlarged. By such increase of capacity there will be a diminution of the pressure of the air in the lungs, and a fresh quantity will enter through the larynx and trachea to equalise the pressure on the inside and outside of the chest.

Inspiration is a muscular act ; the effect of the action of the inspiratory muscles is an increase in the size of the chest cavity in the vertical, the lateral and antero-posterior diameters. The vertical diameter is increased by contraction of the diaphragm, which is dome-shaped when at rest with apex above. When it contracts the convexity decreases.

The lateral and antero-posterior diameters of the chest are affected by the raising of the ribs and sternum by external and internal intercostal muscles.

In extraordinary or forced inspiration, additional muscles are pressed into service, such as sternomastoid, the *Serratus magnus*, the pectorales and the trapezius. Laryngeal and face muscles also come into play. In young children the type of respiration is abdominal, in men it is inferior costal.

Expiration ordinarily is produced by recoil of the chest to its normal position after expansion in inspiration. In all voluntary expiration efforts, however as in speaking, singing, blowing, coughing, etc., something more than merely passive elastic power is necessary, and the proper expiratory muscles are brought into action. The chief of these are the abdominal muscles, the *triangularis sterni*, the *serratus posticus inferior* and the *quadratus lumborum*.

The tidal air is the quantity of air which is habitually and almost uniformly changed in each act of breathing. In a healthy adult man it is uniformly about 500 c. c. or rather more than 30 cubic inches. This will expand at body temperature to 600 c. c. This amount of air is not sufficient to fill the lungs. Haldane gives the capacity of the upper air passages and bronchial tubes as 200 c. c. and therefore about a third of the tidal air is required to fill this dead space. At the end of an expiration, however, the tubes and alveoli are not empty of air, and the sudden in-rush of atmospheric air during the next inspiration effects a complete mixture of this air with that left in the air passages; the air in the axial stream of the current will penetrate as far as the alveoli, but what is sucked into the alveoli is mainly some of the mixture from the bronchial passages, and that in turn is derived from the mixture in the upper air cavities. During expiration the air which leaves the lungs will come in part from the alveoli, but the effect of the stream of outgoing air is mainly as before, to effect a thorough admixture of the air in the intermediate air passages; thus the alveolar air will become mixed with that of the bronchial tubes and that in turn will be mixed with that in the upper air chambers.

Complemental air is the quantity over and above this which can be drawn into the lungs as the deepest inspiration; its amount averages 100 c. inches or 1,600 c. c.

After an ordinary expiration, such as that which expels the tidal air, a further quantity of air about 100 cubic inches or 1,600 c. c. can be expelled by a forceable deep expiration. This is termed reserve or supplemental air.

The total quantity of air which passes into and out of the lungs of an adult, at rest, in 24 hours, varies from 400,000 (Marcet)

to 680,000 (Hutchinson) cubic inches. This quantity, however, is increased, and may be more than doubled by exertion.

Respiratory or vital capacity of the chest is indicated by the quantity of air which a person can expel from his lungs by a forcible expiration after the deepest inspiration possible. The average capacity of an adult at 15.40 C (60°F) is about 225 to 250 cubic inches or 3,500 to 4,000 c.c. It is the sum of the supplemental tidal and complementary air.

The force with which the inspiratory muscles are capable of acting is greatest in individuals of the height of from five feet seven inches to five feet eight inches and will elevate a column of nearly three inches (about 60 m.m.) of mercury. Above this height the force decreases as the stature increases; so that the average of men of six feet can elevate only about two and a half inches of mercury. The force manifested in the strongest expiratory acts is, on the average, one-third greater than that exercised in inspiration.

From every 100 c.c. of arterial blood, about 20 c.c. of oxygen can be removed by the air-pump. Nearly all this oxygen is chemically combined with haemoglobin; the amount in actual solution in the blood is 0.7 c.c. for every 100 c.c. of blood.

Differences between Arterial and Venous blood.

	Arterial blood.	Venous blood.
Oxygen ..	20	8 to 12
Nitrogen ..	1 to 2	1 to 2
Carbon dioxide..	40	46 to 50

[The important distinction between arterial and venous blood is in the oxygen and carbon dioxide and as the table shows, on the average every 100 c.c. of blood which passes through the lungs gain 8 c.c. of oxygen and lose 6 c.c. of carbon dioxide.

The simplest explanation of the passage of oxygen from the alveolar air into the blood is that the process is one of diffusion. This view can be maintained if it can be proved that the pressure of oxygen in the alveolar air is greater than the tension of oxygen in the arterial blood, and therefore greater than that of oxygen in the venous blood.

The conception of respiration based upon this view would be that the pressure of oxygen in the air of the alveoli though less than that in the atmosphere, is greater than that in venous blood; hence oxygen passes from the alveolar air into the blood plasma; the oxygen immediately combines with the haemoglobin, and

thus leaves the plasma free to absorb more oxygen ; and this goes on until the haemoglobin is entirely, or almost entirely, saturated with oxygen. The reverse change occurs in the tissues when the partial pressure of oxygen is lower than in the plasma, or in the lymph that bathes the tissue elements ; the plasma parts with its oxygen to the lymph ; the lymph to tissues ; the oxyhaemoglobin then undergoes dissociation to supply more oxygen to plasma and lymph ; this in turn to the tissue once more. This goes on until the oxyhaemoglobin loses on the average about half of its store of oxygen ; 1 c.c. of arterial blood contains 0.2 c.c. oxygen ; 1 c.c. of venous blood contains 0.1 c.c. oxygen. This has been proved to be so by Haldane and Priestley.

[The foul stream of blood is now distributed among the millions of tiny air cells in the lungs. A breath of air is inhaled and the oxygen of the air comes in contact with the impure blood through the thin walls of the hair-blood like vessels of the lungs, which walls are thick enough to hold the blood, but thin enough to admit the oxygen to penetrate them. Hence the change stated above takes place. It is estimated that in a single day 35,000 pints of blood traverse the capillaries of the lungs, the blood cells passing in single file and being exposed to the oxygen of the air on both of their surfaces.

It will be seen that unless fresh air in sufficient quantity reaches the lungs, the foul stream of venous blood cannot be purified and consequently not only is the body thus robbed of nourishment, but the waste products which should have been destroyed are returned to the circulation and poison the system. Impure air acts in the same way, but only in a lesser degree. It will be seen that if one does not breathe in a sufficient quantity of air, the work of the blood purification cannot go on properly and the result is that the body is insufficiently nourished and disease ensues or a state of imperfect health is experienced. This is the common state of affairs found in modern big cities. This state of affairs necessitates the introduction of correct modes of breathing fresh air.

The Science of Breathing, like many other teachings, has its esoteric or inner phase. Occultists in all ages and lands have always taught, usually secretly to a few followers, that there was to be found in the air a substance of principle from which all activity, vitality and life was derived. They differed in their names and terms for this force as well as in the details of the theory, but the main principle is to be found in all occult teachings and philosophies and has for centuries formed a portion of the teachings of the oriental *yogis*.

This 'vital' force, or *Prana* is in the atmospheric air, but it is also elsewhere and it penetrates where the air cannot reach. *Prana* plays a distinct part of its own in the manifestation of life. We are constantly inhaling air full of *Prana* and are constantly

extracting it from the air and using it for ourselves. We may store away *Prana* as the storage battery stores away electricity. The many powers attributed to advanced occultists is due largely to their knowledge of this fact and their intelligent use of this stored up energy. One who has mastered the science of storing away *Prana*, either consciously or unconsciously, often radiates vitality and strength which is felt by those coming in contact with him, and such a person may impart this strength to others, and give them increased vitality and health. What is called "Magnetic Healing" is performed in this way.

The breathing mechanism of man is so made that he may breathe either through mouth or nose.

It is important for him which method he uses, for one gives health and strength and the other gives disease and weakness. There is arrangement in the nose for sifting the air of its solid particles and warming or cooling the air going into the lungs. The nose breather is a deep breather. There is no such arrangement in the mouth. The mouth breather is shallow breather.

METHODS OF RESPIRATION.

1. High breathing. In this only upper $\frac{1}{3}$ rd of the chest moves on both sides in the breathing in and out.
2. Mid breathing.—In this only middle $\frac{1}{3}$ rd of the chest moves on both sides in respiration.
3. Low breathing or abdominal breathing. In this lower $\frac{1}{3}$ rd of the chest moves in respiration.
4. Complete breathing.—In this the chest moves in all its parts in respiration.

The time is very short, hence I cannot describe properly the methods of respiration and breathing exercises. Those of you who feel interested in the subject I will instruct in breathing exercises.

MALARIA.

By DR. HARNAM SINGH, M.B., B.S.,

Medical College, Lahore.

Introduction :—I have been asked to speak on a subject, which is of vital import, from the point of view of Public Health in this province where Malaria has been sapping the vitality of the people and causing heavy mortality every year. It lowers vitality, thus exposing the constitution to a thousand and one bodily ailments, and brings on anaemia, nervousness and in certain cases even sterility. It is responsible, in many cases, for complete nervous break-down, impairing both morality and will

power, People subject to its recurrent attacks, get badly impaired physically and they pass this physical weakness on to their offspring, who are naturally puny, and thus more prone to the attacks of malaria, and other acute infections, such as dysentery, pneumonia and infantile diarrhœa which affects infants the moment they see the light of day. To these fell diseases they often succumb.

Malaria is rapidly fatal, when it takes on one of the two forms that are known as algid or cerebral types. Malaria influences the birth rate, death rate, infantile mortality and the longevity of a people, undermining their constitution and impairing their intelligence.

The total mortality is high, not only on account of the direct results of this disease, but the following diseases also for which Malaria is, in no small degree, responsible :—

- (a) Acute intercurrent diseases ;
- (b) Other acute diseases ; *e.g.*, dysentery and pneumonia, to the attacks of which the system gets very susceptible in malarious subjects.
- (c) Resultant abortions or still births.

In case of school-going children it not only wastes a good deal of their time and keeps them away from their books, but diminishes their capacity for work, weakens their memory, and creates a disinclination for work. An intelligent little scholar, who always tops his class, will be found quite a dunce, if neglected as regards proper and prolonged treatment, and allowed to remain a subject to malaria for 3 to 4 years.

The same is true of grown-up people, whose loss of capacity for work naturally affects their earning capacity ; but it also indirectly costs a Province like the Punjab, which is badly malarious, a heavy loss and expense.

Some of the areas in this province suffer badly, which gives rise to a deplorable state of health of the people, to whom life is simply a burden. A state of general cachexia is present in the form of marked anaemia and sallow face, with a peculiar pale or greyish hue, or an ashy pallor of the skin, and a mark of a peculiar dusky black pigment imprinted in the form of a saddle on both the cheeks and passing over the nose. A more noticeable feature is a marked emaciation, and a large prominent and unsightly abdomen. Irritability of temper, sluggishness of habits, want of natural activity and a general condition of nerve exhaustion, are the features which complete the picture of this woe-begone people. The disinclination for work is so marked in the former classes of the affected areas, that at the time of the harvest, labourers from neighbouring districts have to be called in to mow the crops and to undertake all in connection with them ; while their lazy

indolent employers seat themselves comfortably by the side of their fields, and try to sink the sorrows of their miserable lot in the hubble-bubble of a small hooka (pipe). They are passive on-lookers of the game, the pleasures of which they once enjoyed.

To sum up then, malaria does not only affect the physical development of children and young people but adversely interferes with the mental capacity of its victims.

It is, therefore, essential that we should have some knowledge of this fell disease, which gives an appallingly high death rate and plays an important role in the total annual mortality of the province.

It may be mentioned that in this province alone :—

(i) Malaria takes a very heavy toll in the form of mortality of not less than 350,000 people annually out of a total population of 20,685,440. The annual malaria mortality is a very heavy one when compared with that of a reputedly malarious country like Italy, with 33,500,000 people, where the annual death rate is much less than 15,000.

(ii) It has a greater effect on the total mortality rate, the malarial death rate being much higher than that of any other diseases.

(iii) It influences the infantile mortality to a great extent.

(iv) It is responsible for most of the still births and abortions.

(v) It effects all classes of people, but the poor are much more susceptible to its ravages.

(vi) Endemic Malaria prevails nearly all over the province, and certain areas are visited by epidemics of malaria, when suitable climatic and other favourable conditions set in there.

GEOGRAPHICAL DISTRIBUTION OF MALARIA.

The disease is distributed over a great part of the world. It hardly extends beyond 64° North, 55° South. Between the latitudes 64° North and 55° South, the low-lying plains about sea level valleys and deltas of the large rivers are all malarious.

England and Wales which were once free from malaria have again got infected to a certain extent during the Great War.

Scotland and Ireland are still practically free.

India — Here parts of the North-Western Frontier Province, the Punjab, United Provinces, Bengal, Madras, Bombay and Ceylon are badly malarious. The Andamans are pretty bad. Burma and Siam are badly infected and the foothills of the Himalayas between 2,000—4,000 feet above sea-level and below these levels some areas are notoriously malarious,

ETIOLOGY.

A.—Predisposing Causes :—

The factors which favour the spread of the disease are manifold. The transmission depends on :—

(1) The factor influencing the development of parasites in the midgut (stomach) and salivary glands of the mosquito.

(2) Seasonal prevalence of certain species of an opheline mosquitoes which carry the infection.

(3) Influence of certain favourable atmospheric conditions, *e.g.*,
(i) Temperature “The mean monthly temperature favourable for malarial mortality ranges between 20·9°C (69·6° F) and 31·6° C (88·9° F) and the range of temperature favourable for the transmission of infection ranges between 16° C (60·8 F) and 33·6° C (92·5° C)” according to the observation of that renowned malariologist Lt.-Col. C. A. Gill, I. M. S., of the Punjab. These conditions are further influenced by atmospheric moisture.

(ii) Humidity—which should be about 61% for transmission of infection. For malarial mortality the ranges are between 63—73·5%.

(iii) The Rainfall.—The influence of this factor on malarial incidence is a decided one. It is responsible for the production and upkeep of the breeding places of the mosquitoes, the multiplication of *Anopheles* and for floods. Heavy downpour at long intervals is not so productive of an outbreak or increased incidence of the disease, as moderate showers at short intervals.

(iv) Latitude.—The incidence of malaria increases as we approach the equator. As already observed malaria usually invades the regions between 64° North and 55° South.

(v) Season.—The autumnal months of September, October and November are favourable for an outbreak of an increased incidence to a marked degree. Increased incidence again makes its appearance though in a very mild form in the months of March and April.

(vi) Altitude.—Malaria goes hand in hand with low marshy lands, valleys, estuaries of large rivers, and low coasts ; while very high altitudes are thought to be inimical to the incidence of malaria. Scarcity of the carrier insects is observed at so high a level as 6,000—8,000 ft., but at altitudes between 2,000—4,000 ft. malaria is more severe and constant. In the plains of the Punjab which are mostly between 600 and 1,000 feet above sea level the disease is almost endemic everywhere.

(vii) Soil.—Impermeable soils help in maintaining the breeding places for a good long time, to complete the larvae and pupae stages of the mosquitoes.

(viii) *Overturning of Soil* is said to be usually followed by an outbreak.

(ix) *Floods* have been known, for centuries, to be a favourable cause of outbreak of the epidemics by increasing the number of breeding places and development of marshy lands.

(x) *Thick Bush*.—Jungle trees rank vegetation weeds and other aquatic plants contribute, not a little, to the development of malaria, by giving protection to the larvae and adults under them.

(xi) *Winds* have little effect except in carrying the adult insects for miles away from their breeding places or other places of shelter.

(xii) *Cultivation of certain Crops*.—Proximity of rice fields to towns and villages is dangerous, as anopheline larvae breed in these fields in enormous numbers.

(xiii) *Sluggish Movement of Water*.—Sluggish currents with weedy banks afford a favourable haunt for breeding of anopheline larvae.

(xiv) *Canals, dams, railway embankments, ponds, tanks, burrows, pits and other water collections* foster anopheline larvae and pupae, especially when the surface water stagnates in them.

(xv) *Long exposure to chills, heat, hardwork and fatigue* bring on an attack of malaria in old cases.

(xvi) *Changes from malarial to non-malarial locality* brings out latent malaria.

(xvii) *Physical condition of the body*.—Latent malaria often develops with delivery, and just after major operations. *Pneumonia, dysentery and infantile diarrhœa* make one more susceptible to attacks of malaria and the reverse is also true.

(xviii) *Old ruins and dilapidated houses* give shelter to adult mosquitoes and larvae breed in small collections of water, which naturally form there during the rainy season.

(xix) *Famine* also encourages the epidemic or increased incidence by lowering the vitality of a people.

B.—Actual Causes :—

Next I take up the actual causes, but I shall recount a few of them just in passing. A detailed study and a thorough comprehension of them is possible only with the professional. I shall mention here only such facts as may be useful to the layman. The infection is carried from man to man through the bite of a

mosquito, conveying a parasite which is actually responsible for the disease. The actual causes thus are :—

1. The parasite.
2. The bite of a anopheline mosquito.
3. Man to whom the infection is transmitted.

Some knowledge and facts about these will be very useful to understand the mechanism of the attack.

The Malarial Parasite is the disease germ, and is found in the blood and spleen of all those people who are ill with malaria. It is a protozoan of the species *Haemamoeba* or *Blasmodium*.

The Anopheles Mosquito.—It has been proved, beyond doubt, that it is the bite of certain species of the *Anopheles* mosquito, that causes malaria, if some of the parasites have been injected into the body of a human being. It is not every mosquito that can give one the infection. There are many species of mosquito, but generally they are put under two genera :

(a) *Culex* and (b) *Anopheles*.—Of these *Culex* is not concerned with the propagation of malaria. It is only a few varieties of the anopheline mosquitoes which are responsible for the spread of malaria.

The Mechanism of Infection.—This is how it happens. The *Anopheles* bites a malaria case, such in the parasites with the blood and can, between 10—14 days of this occurrence, infect a healthy person by injecting these bodies into his blood.

There are four stages through which the insect passes and these are given as under :—

(a) *The Ova or Eggs*.—Duration of stage from 2—4 days.

(b) *The Larvae or Wriggle Tails*.—Duration from 10—14 days ; may be two months or more in winter.

(1) They float horizontally on the surface of water.

(2) They like clear water to breed in, but may be found in small stagnant pools, water collections, hollows of trees, pieces of broken glass bottles, bamboos, but only where there is an ingress of sunlight.

(3) The anopheline larvae have been found under frozen surface of water in the vicinity of the Rotang pass over 10,000 feet above the sea level.

(c) *The Pupa or Nymph*.—Duration of the stage 2—5 days except during winter, when it may be fairly prolonged.

(d) *The Imago or Adult winged insect* :—

(1) The resting position is quite characteristic as the body makes an angle with the surface on which it rests.

(2) The wings are spotted, and have got a special arrangement of veins of these wings.

Some characteristic habits of the adult Anopheles.

(1) It is a night feeder, usually bites about dusk, or in the night, but may feed during the day after oviposition—if it outlives the process—when the insect is usually very hungry.

(2) It is usual with the insect to hide in woods, under leaves of thick bush and small trees or in dark corners of houses about the ceilings, along side rafts, and along hangings in the day time.

(3) The insect has a special liking for dark colours.

(4) Majority of *Anopheles* live on fruit and vegetable juice and attacks man or cattle only as opportunity occurs or when convenient.

(5) The male is not a blood sucker ; it is the female *Anopheles* alone which feeds on blood as well and becomes infected and infective of malaria.

(6) A female usually lays 100 -155 ova at a time.

(7) Very few of the adults survive the process of oviposition.

(8) The female has been noticed to suck the blood of mammals, birds and occasionally cold blooded animals, and even other insects.

(9) The insect is very fond of leather odour.

(10) The average flying distance is about a mile, but it has been noticed to fly for $2\frac{1}{2}$ miles or over in search of food in the Philippine Islands. (Craig).

(11) The male is not longlived. The female usually lives from 10—126 days, but may live $2\frac{1}{2}$ months depending on the temperature it lives in. It may hibernate throughout winter.

(12) Knowing that only one in five *Anopheles* fed, becomes infective under ideal laboratory conditions, and that very few outline the process of oviposition, and also the fact that only a small number of malarial cases are good transmitters of the

infection the danger of a broadcast outspread of malaria is minimised. Moreover the number of infective Anopheles in nature is pretty small.

SPECIES OF MALARIAL PARASITE.

There are three different species of the Parasite that exist in nature :

- (a) Benign Tertian Parasite or Plasmodium Vivax.
- (b) Quartan Parasite or Plasmodium Malarial.
- (c) Malignant or subtertian or Aestivo Autumnal Parasite or Plasmodium Falciparum.

Human Factor.

As man is a local reservoir of infection, it is better to mention that :—

(i) One may be quite a poor carrier of the disease and termed a “ Poor Infector,” one may be a “ Good Infector.”

(ii) Sex :—The disease affects both the sexes, but it is observed that the incidence is comparatively low amongst females.

(iii) Infants and children are more susceptible to its ravages, and suffer badly at this tender age.

(iv) It is chiefly a disease of the poor. People of higher social position are not spared, although they do not suffer to the same extent.

Mechanism of Attacks of Malaria Fever.

The incubation period, as determined experimentally varies from 6—21 days.

	Minimum.	Maximum.	Average.
Benign Tertian Malaria	6	21	11
Quartans	„ 11	18	14
Malignant Tertian	„ 2	14	6

The liberation of each brood of the parasite in the blood stream coincides with an attack of fever.

1. *Regular Benign Tertian*.—The attack comes on every day. In this fever with two broods, the attack may come on daily.

2. *Regular Quartan*.—The attack comes on every third day. In Quartan with two broods there may be fever on two successive days and others may be a fever-free day. If there are three broods, there may be a paroxysm daily.

3. *Malignant or Sub-Tertian or Aestivo Autumnal Fever or Pernicious Malaria*.—The characteristic features are :—(i) the irregularity of the course which may vary greatly, and (ii) the permiousness of the symptoms. The duration of the attack is about 24 hours and the usual interval between the two attacks, from 8 or 10 to 24 hours, varying with the length of the attack.

4. When several broods exist together, the attacks may run into one another or overlap each other, and produce the *Irregular or Remittent Fever*.

Clinical Picture.

1. *Prodromal Stage*.—After a day or two premonitory symptoms of general malaise and lassitude, produced by a large number of parasites circulating in the blood stream, before they are numerous enough to bring on an attack, the actual paroxysm comes on.

The usual course is 3 stages :

- (i) cold stage,
- (ii) hot stage, and
- (iii) sweating stage.

1. *The Cold Stage* —(Duration an hour or so). The patient shivers violently, his teeth chatter, the skin gets pale, goose skin and livid with papillae raised. He passes urine freely and frequently. There may be a loss of appetite, severe headache, pains in the back and limbs, and vomiting in some cases. The pulse is usually rapid and feeble. Towards the end the temperature may go as high as 102—105°F.

2. *The Hot Stage*.—The average duration is about 10—12 hours. The skin gets hot and dry, and face flushed. The patient complains of a burning sensation all over. The feet may still feel cold for a short time at the beginning of the stage. There is intense headache, parching thirst, full and rapid pulse and quick breathing. Sometimes delirium may set in. Some people in this stage get extraordinarily quiet, while others are unusually talkative. Vomiting and reaching may trouble the patient, urine gets darker, and is highly coloured. Throbbing of the vessels about the temples may be noticed, and the bowels, as a rule, usually keep costive, in some cases diarrhœa may supervene. One may feel the enlargement of the spleen at this stage. The tongue is heavily coated, and the taste may get bitter. The temperature may go to 104 F or even higher.

3. *The Sweating Stage*.—Duration is usually 3-4 hours. Perspiration starts at the root of the hair, and on the face, but it becomes general in a short time. The pulse gets softer, and the

temperature falls gradually to the normal. Urine now gets scanty and highly concentrated, and deep coloured. A feeling of calmness prevails.

Other usual or unusual accompaniments.

1. The cold stage may be very slight, or altogether absent.
2. A severe attack of Remittent Fever with pernicious symptoms may stimulate enteric or typhoid fever.
3. Marked pallor, dusky hue of the skin, periodicity and weakness of the body are distinctive features of the disease.
4. Herpes may appear on any part of the body, but more commonly about the lips and nostrils.
5. In some cases the pains about the joints are so severe, that one may confuse the attack with that of acute rheumatic fever. I have seen cases which were mistaken for the latter disease.
6. The parasites, if accumulated in unusually large numbers at one place, may upset that system and produce local signs and symptoms there, *e.g.*
 - (a) Reaching or bilious vomiting or both these with or without severe diarrhoea or dysenteric stools may accompany the attack of the fever.
 - (b) Amblyopia, (Total blindness) or Nictal Opia (night blindness.)
 - (c) Unconsciousness, delirium, partial paralysis, perises, scanty or staccato speech or bulbar paralysis.
 - (d) In the joint severe pains as observed above.
 - (e) In the skin erythema eczema or Urticaria.
 - (f) In the nose, paroxysmal and periodic sneezing or bleeding.
7. The disease has a great tendency to produce small local haemorrhages, as nasal bleeding, bleeding from the stomach, bowels and from urinary passages and patochial haemorrhages under the skin.
8. Enlargement of spleen is a characteristic feature. There may be slight enlargement of the liver in rare cases.
9. Pigmentation of internal organs, tongue and face about the cheeks on either side of the nose, is also often noticed.

Other types of Malaria.

They are (i) The Algid, (ii) Choleredic, (iii) Cerebral, (iv) Black-watery, (v) Latent or masked malaria characterised by relapses, and (vi) Malarial Cachexia.

Unusual Types.

I have observed cases without any rise of temperature, the only symptom being excruciating pain in the epigastric region, or pericardic region, pericardiac urticaria, or sneezing or diarrhœa, severe abdominal colic lasting for a day or so, and coming on every 7th day or the day shown usually by a multiple of 7 or 13.

Diagnosis.

This specific fever is characterised generally by :—

1. Periodicity :—Symptoms or attack of fever ushering in again and again at regular intervals.

2. Susceptibility or proper response to quinine :—

Therapeutic Test :—An intermittent or even remittent fever resisting efficient doses of quinine for 4—7 days is not malaria.

3. Appearance of the parasites responsible for an attack in the red cells of the patient's blood, and in their absence marked increase of mononuclear leucocytes (16—20% or above) and certain other changes in the red cell.

4. Enlargement of the spleen.

5. Pigmentation of tissues, cheeks or tongue.

Treatment.

The control of the disease.

1. Preventure Measures.

Malaria may be controlled to a large extent by :—

A. Attacking the *Anopheles* larva by :—

(i) A proper drainage of the breeding places of mosquitoes.

(ii) Reclamation of lands which should be made elevated.

(iii) Pouring of kerosine oil or paris green on large surfaces of water, pools and shallow streams regularly twice a week.

(iv) Clearing the edges of streams, ponds, tanks, and large collections of water or other breeding places free of rank, vegetation and grass, and making them level.

(v) Filling up burrows pits, shallow pools, small tanks or other breeding places.

(vi) Removing rubbish broken bottles, old tins and barrels from the vicinity of habitation.

7. Clearing the surface of the breeding places of *Spirogyra* and other weeds.

8. Increasing the velocity of a current by making the gradient more sloping.

9. Stocking the permanent breeding places like ponds, tanks, small streams with fish known as *Gambusia*. This fish multiplies rapidly, lives in any available water, does not attack other fish or their spawn, nor does it migrate.

B.—Reducing the number of adult Anopheles by :—

1. Clearing the jungle or thick wood in the vicinity of towns and villages.

2. Removing rank vegetation or thick bush in the proximity of habitation.

3. Removal of ruins and bringing down dilapidated houses.

4. Protecting human beings from the bite of the insect, by screening houses, windows, ventilators, shutters, and doors and the proper use of mosquito nets over beds.

Caution.—The meshes of the wire gauze, or gauze for mosquito netting should be at least No. 18, i.e., 18 meshes to each square inch.

5. Preventing the adult insect from biting human beings by the provision of stables and cowsheds in the vicinity of habitation ; as the mosquitoes will perferably bite and feed on cattle and horses, as they are seen in larger numbers in these places as compared with habitable houses.

6. Making the houses and rooms innocuous to the shelter of these insects by smoking the houses with chemicals like sulphur or herbs like *Pyrethrum*, Tobacco and *Datura stramonium* or the stables with rubbish, hay or dried grass.

7. Avoiding exposure of the body at the time of the dusk and early hours of the night at least, if not the whole night when the mosquitoes are very hungry, and seek protection in houses after their return from collections of water where they go to quench their thirst and lay eggs.

8. Use of mosquito oil, which keeps off the mosquitoes for at least 8 hours after its application to the skin.

The oil is prepared in the following way :—

Mix equal parts of the best kerosene oil (Snowflake) and ordinary mustard oil (Serson ka tel) ; let it stand and decant after 24 hours ; add $\frac{1}{1000}$ part of pure iodine crystals previously

dissolved in oil of Citronella or lemon grass which should be $\frac{1}{6}$ — $\frac{1}{4}$ part of the whole mixture. It is superior to other preparations, in being pretty cheap with its effect lasting for several hours, unlike other Volatile oils of the market, which evaporate so soon ; or other preparations with thick viscid oils like coconut oil as their basis.

C.—Attacking the parasite by issuing prophylactic quinine in 3—5 gram doses daily in the evening or to children with their dinner, to people with enlarged spleen or old infected cases ; in other words, reservoirs of disease in a locality, and to the public at large too during the malaria season.

D.—Treatment of Man by :—

Instructing healthy persons to

1. Make use of prophylactic quinine, as explained above, to ward off an attack.
2. Make use of mosquito net.
3. Screen one's house.
4. Rub on mosquito oil about dusk.
5. To smoke one's house every now and then if possible and desirable.

II.—General Treatment.

1. Rest in bed, warmth to body and use of blankets, and encouragement of hot drinks during the cold stage.

2. *For High Temperature*, cold sponging, cold water, enema or cold packing do a lot in giving comfort to the patient, and reducing his temperature.

3. Headache may be relieved by the application of cold water or ice to the head, bathing the forehead with iced water and vinegar or Eau de Cologne mixed with water.

4. Restlessness, vomiting, reaching, diarrhœa and other pernicious symptoms demand the use of drugs and this call for medical aid.

5. Combating the actual disease :—The disease itself can be overcome by a proper use of Cinchona (in chronic cases specially) and its alkaloid quinine, which are true specifics for this fever, in small efficient and repeated doses to keep the system sufficiently saturated without manifesting its deleterious effects, in the form of vomiting, ringing in the ears, urticaria or other cerebral symptoms.

The only drawback in quinine treatment is that quinine kills the rings and mature sexual forms of the parasite only, but it does not touch the sexual forms or gametes at all. It cannot therefore cure the disease, but can only prevent its attacks.

A new drug Plasmochin, however, has been produced in Berlin and proclaimed to kill sexual form of the parasite and its use in conjunction with or without quinine, if it does not affect a cure alone, is said to be unfailing and quite effective.

History of Cinchona Bark.

The alkaloid quinine and its different salts are isolated from Cinchona bark.

The bark was introduced into Europe in 1640 by the Countess del Cinchone Vice-Queen of Peru, hence its name in her honour. It was known as Countess Powder or Jesuits Powder Canizaris. Its efficiency in malaria was known to West Indians. The Corregidor of Lexa, in Equador hearing of the severe illness of the Countess with Tertian malaria at Lime in 1638, advised her Physician De Vega to give the bark a trial, which effected a prompt cure. On her return to Spain she brought a quantity of the bark with her. It was imported into England in 1671 by Sir Robert Talbot who kept it a secret and sold it at 100 louis d'or per pound. Louis the XIV was cured by this quack in 1679, and with a concentrated tincture of it. He purchased the secret by paying £4,800 and a life annuity of £200.

In India it was used by Bogue as early as 1657. During the eighteenth century the bark and its properties were known all over the world.

THE POSSIBILITIES OF SERVICE FOR SCHOOL STUDENTS IN THE DOMAIN OF HEALTH.

BY PT. BISHEN DAS, B. Sc.

Movements like Play-for-all, Refreshment-for-all, and Scouting well organised have produced a remarkable change in the physique of students. The Education Department too has made a special provision for the physical training of school boys.

In spite of all this the health of our scholars is far from being satisfactory. Bad, dirty teeth, pale faces, and weak chests, are very common sights in any school. We rightly complain that short sight in boys of school-going age increases with the advance in age. Statistics have been prepared to show that no less than 33 per cent. of school children in India are supposed to have defective vision. The number of school boys suffering from

skin diseases like ring-worm, scabies, etc., can in no case be said to be negligible.

Now who is to look after these defective boys and give them the proper guidance ? The parents in such cases are mostly uneducated and do not attach the slightest importance to these defects in their children. Their next guides are their teachers but their duties are so manifold that they cannot cope with the situation. Others with whom they come in contact are their school companions and amongst these there are many with sympathetic dispositions ready to serve their unfortunate play-fellows only if they can do so. It is here in these school boys that we can find willing and useful workers who can successfully take part in this campaign of health. But they stand in need of some training, proper guidance and supervision.

The scope of this training and nature of guidance and supervision if once determined, effectually solves the problem to a very great extent.

Here an attempt will be made to show what little in this direction has been accomplished in a high school in this province. It is a matter of pride that this experiment which has met with such a significant success was begun at the inspiration of Dr. Whitehouse, D. Sc., I.E.S.

THE EXPERIMENT :

Formation of Health Club in the School :—

Early in the beginning of the year the aims and objects of the club and the nature of the work that was to be expected of its members was explained to the students in a general gathering of the school and out of a number of boys who were willing to enrol themselves as its members, only twenty were selected from all the departments of the school. The following points were taken into consideration while making selection :—

1. That each class from the 5th to the 10th, each of the two boarding houses and every quarter (Mohalla) of the city be well represented.
2. That the members selected be such as were previously in the habit of being neat and clean.

The Scheme of Work.

A health club in order to be worth the name must do something substantial for the improvement of the health of students. Its object is to make the corporate life of a school more healthy to make the chest broader and deeper, the blood richer and purer, the appetite keener and slight troubles less frequent.

With a view to achieve the results referred to above a complete scheme of lessons and practical work, as given below, was framed :—

Month.	No.	Subject.
January	1.	Personal Measurements.
February	2.	Do.
	3.	General principles of health.
	4.	Condition of spleen, liver, teeth, hair.
	5.	Medical examination of 9th class.
	6.	Sanitation of kitchen, latrine, rooms.
	7.	Practical Medical Examination, $\frac{1}{2}$ 8th class.
	8.	Medical Examination of the remaining students of 8th.
March	9. }	Imp. points about the diseases :—Mumps, ringworm, itch, tonsils.
	10. }	
	11.	Medical Examination of $\frac{1}{2}$ 8th class (new) after classification.
April	12.	Medical Examination of the 8th class.
	13.	A few imp. hints regarding First Aid.
	14.	Do.
	15.	Do.
	16.	Do.
May	17.	Do.
	18.	Do.
	19.	Do.
	20.	Do.
June	21.	Medical Examination of $\frac{1}{2}$ 7th class.
	22.	Medical Examination of $\frac{1}{2}$ 7th class.
	23.	Value of important foods.
	24.	Do.
July	25.	Do.
Sum. Vac.	26.	Medical Examination of $\frac{1}{2}$ 6th class.
September	27.	Do.
	28.	Malaria.
	29.	Do.
October	30.	Disinfection.
	31.	Do.
	32.	Medical Examination of $\frac{1}{2}$ 5th class.
	33.	Do.
	34.	Examination.

November	35. Medical Examination of new students
	36. Personal measurements.
December	37. Do.
	38. Excursion.

Important features of the scheme :—

1. *Medical Examination.*—The school age is the age of rapid growth and development. Weight, stature, chest-measurement, vision, and hearing power are important indications of healthy growth. Any mark of sudden stoppage of increase of weight, height, etc., is a sign that something is interfering with the general development of the body. A chest poor in shape and capacity shows that the lungs are defective. A boy having short sight carrying on his struggle with the small typed pages of his book is a depressing sight. The ignorance and unobservant nature of these students accelerate their defects and they are felt all the more keenly. Hence it seems absolutely necessary that all the school students should be medically examined at regular stages after a certain interval.

Realizing all this, medical examination of the scholars has been given a prominent place in the curriculum of the Health Club. Each boy on the roll of the school has to present himself for this examination after an interval of one year. It is contemplated to cut this period down to six months.

The complete medical examination of a boy includes the measurement of height, chest capacity, weight, vision testing, testing hearing power and noting the condition of teeth, tonsils and general cleanliness. This examination is conducted by the members of the Health Club who have had a training for the entire test.

Details of Medical Examination :—

1. *Weighing* :—Increase of weight may be taken as a rough measure of the growth of an organism. Some take it as a criterion of health during the age of adolescence. The average rate of growth is a safe indication of the general health of a boy.

So provision has been made to take this measurement accurately. There is one personal weighing machine costing Rs. 27 at the disposal of the Health Club. The machine is quite accurate and the members of the Health Club are thoroughly acquainted with its use.

Height measurement :—This measurement is taken by a **very** simple but efficient device. A measuring scale showing division of feet and inches has been fixed on one side of a wooden almirah against which a boy can be very easily made to stand,

Chest capacity :—Small tapes costing 2 annas each are used for measuring the chest capacity before inspiration and after inspiration. All due precautions are taken while conducting this measurement.

Vision Testing :—The welfare of the eye is often neglected by school boys. It scarcely receives a passing thought much less an examination. Short sight in students increases with age.

Only a rough test is all that is expected from the Health Club of the school. More accurate testing in the cases where some defects have been discovered is left to a doctor.

This work is being well accomplished with the help of two eye-charts placed at measured distances.

Hearing Power :—Standard watch, a science laboratory table, a measuring tape and a clean handkerchief are the only things required for testing ears. Along with examination of other organs ear testing also seems to be advisable and is not a difficult task. All the members of the Health Club know quite well how to conduct the examination of hearing power.

Teeth and Tonsils :—The condition of teeth and tonsils which is very often the chief factor of determining a student's defective health is also noted and recorded and this completes the medical examination of a boy.

2. *Cleanliness* :—The second important feature of the curriculum is training in cleanliness. The unclean habits of any scholars sometimes become a danger to the whole school.

The members of the Health Club are given a thorough training in cleanliness. It is emphasised that their first care must be their own example. Their appearance and habits should show their repugnance of dirty habits. They are required to make every effort possible to create a tone of cleanliness in their respective spheres.

3. *First Aid* :—Accidents are very common in a school. Delay in action on account of ignorance of what to do until the doctor comes has sometimes proved fatal. A little knowledge of First Aid may often prevent great agony. So an elementary knowledge of this subject seems to be essential for the members of a Health Club.

Records maintained by the Health Club :—

1. The most important record that is prepared by the Health Club is one showing the general health of each boy of every class. It is divided into the following sub-heads :—Name of the boy, weight, height, vision, (R. eye, L. eye), hearing power (R. ear, L. ear), tonsils, teeth, general condition of health and remarks by the teacher in charge of the Health Club.

2. Record showing the names of boys having weak eyesight and the extent of the defects.
3. Record showing the names of underweight students and the weight that should bring them to the normal.
4. Records showing the names of boys having weak chest and the nature of their weakness.
5. Record showing the names of boys having weak ears, teeth and tonsils.
6. A list of students possessing 1st class health.

Measures adopted to remove these defects :—

Mere medical examination of students is no remedy and unless it leads to measures calculated to remove the causes of the troubles it seems to be of no real use. Keeping this in view the Health Club is carrying on regular propaganda for removing the prominent defects in the students of the school.

Short-sight.—The students found to be shortsighted are advised to persuade their parents to allow them to get their eyes tested by an eye specialist and procure the glasses prescribed by him. Special arrangements have been made with Dr. Hukam Chand Beri, Civil Hospital, an eye specialist, to test the eyes of students of this school at considerably reduced rates. Very poor students get their eyes tested gratis. During this short period of 10 months nine students have got spectacles through the persuasions of the Health Club.

Teeth Cleaning.—On being medically examined about 50 per cent. of the students were found to have bad teeth. The ordinary *datan* being found not quite effective in removing the hard layer of tartar and dirt a very cheap powder was prepared in consultation with the local doctor and was found useful on being tried on a boy having very bad teeth. Other students are also advised to use this powder.

Weak Chest.—Special breathing exercises have been specified after consulting several books on the subject to remove this defect. The proper method of inhaling and exhaling is taught to pupils. In this connection it may not be irrelevant to state that of our native games Kabbadi is best suited for boys having weak chests.

Weak Physique.—Nothing has been done so far in removing this defect. After a good deal of consideration it has been now decided that such defective students should be given a little refreshment daily in the recess period. The headmaster of the institution, without whose guidance and help all this would have been impossible, has very kindly agreed to meet the expenses of the very poor students having defective physique from

some fund at his disposal. Others will be required to pay a sum of Re. 1 per mensem. It has been noticed that the chief causes of poor physique in over 80 per cent. cases are either students being underfed or want of exercise if they get proper nutrition.

Future of the Club.—The future of the club is bright inasmuch as the useful propaganda that is being carried out will lead to the amelioration of many unfortunate cases and improve the general health of most boys of the school. The greatest advantage that is to come out of it will be that the work of the club will unconsciously develop in its members love of humanity and make them not only useful citizens but philanthropists. It is not a vain hope that most members of this club may take to the medical profession and prove to be workers to reduce the suffering human race.
